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CHEMISTRY LINEARY









INSTITUTE OF CHEMISTRY

OF

LEAT BRITAIN AND IRELAND.

PROCEEDINGS.

PART I. 1887.

Zondon:

, BY A. P. Blundell, Taylor & Co., 26, Garlick Hill, Cannon Sr., E.C.

1887.



PROCEEDINGS

OF THE

INSTITUTE OF CHEMISTRY

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GREAT BRITAIN AND IRELAND.

PART I. 1887.

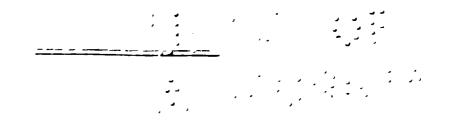
REPORT of the ANNUAL GENERAL MEETING,

BALANCE SHEET FOR 1887,

AND

ADDRESS OF THE PRESIDENT,

PROFESSOR ODLING, M.A., M.B., F.R.S., &c.



Jondon:

PRINTED BY A. P. Blundell, Taylor & Co., 26, Garlick Hill, Cannon St., E.C.



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ANNUAL GENERAL MEETING.

- THE First Annual General Meeting of the Institute of Chemistry of Great Britain and Ireland, as incorporated by Royal Charter, was held at Burlington House on Monday, the 14th of March, 1887.
- The Balance Sheet (see p. 4), having been laid before the Meeting by the Treasurer, the President delivered his Address.
- The Officers and Council for the ensuing year were then elected (see p. 5).
- The CENSORS elected were Sir Frederick Abel, Dr. James Bell, Dr. E. Frankland, and Dr. W. J. Russell.
- Dr. Percy F. Frankland, Mr. C. E. Cassal, and Mr. H. J. Helm were appointed Auditors.

OF CHEMISTRY OF GREAT BRITAIN AND IRELAND. INSTITUTE

INCORPORATED BY ROYAL CHARTER.

STATEMENT OF ACCOUNT AND BALANCE SHEET,

FROM 18T JANUARY TO 31ST DECEMBER, 1886.

PERCY F. FRANKLAND.	Audited and found correct,
	, £3,500 3°/o Consols.
December 31st, 1886 None.	Assets. December 31st, 1886, Cash at Bank £1,288 15 1
* 11 0011X	*I,750 I7 4
61 750 17 4	
Current A/o 288 15 1 1,268 15 1	
81st December, 1886:—	0
Westminster Bank,	101 10 0
Parliamentary Agents 8 8 0	82 11 0
Salaries and Wages 165 0 0	inhomintions 445 4 0
Examiner's Fees and Examination Expenses 42 10 7	45 3 0
Advertisements 15 5 6 Ront Office and Miscellaneous Expenses 99 11 6	Entrance Fees 7 7 0
Printing, Stationery and Postage 88 13 7	1105 9 4
£ 8. 11.	£ 8. d. £ 8. d.

H. H. B. SHEPHERD.

A. J. GREENAWAY.

Jan. 26th, 1887.

LIST OF OFFICERS & COUNCIL FOR 1887.

PRESIDENT.

W. ODLING, M.A., M.B., F.R.S., &c.

VICE-PRESIDENTS.

SIR FREDERICK ABEL, C.B., F.R.S., &c. H. E. ARMSTRONG, Ph.D., F.R.S., &c. SIR CHARLES A CAMERON, M.D., &c. A. DUPRÉ, Ph.D., F.R.S., &c. J. FERGUSON, M.A., F.C.S. E. FRANKLAND, Ph.D., D.C.L., F.R.S., &c.

TREASURER.

DAVID HOWARD, F.C.S.

ORDINARY MEMBERS OF COUNCIL.

A. H. ALLEN, F.C.S. JOHN ATTFIELD, Ph.D., F.R.S., &c. B. E. R. NEWLANDS, F.C.S.

A. J. BERNAYS, Ph.D., F.C.S.

M. CARTEIGHE, F.C.S.

W. Y. DENT, F.C.S.

T. FAIRLEY, F.R.S.E., F.C.S.

C. GRAHAM, D.Sc., F.C.S.

W. HARKNESS, F.C.S.

D. B. HEWITT, M.D.

A. K. HUNTINGTON, F.C.S., &c.

F. R. JAPP, M.A., Ph.D., F.R.S., &c.

E. KINCH, F.C.S.

H. McLEOD, F.R.S., &c.

GEORGE H. MAKINS, F.C.S.

JAMES BELL, Ph.D., D.Sc., F.R.S., &c. C. O'SULLIVAN, F.R.S., &c.

F. J. M. PAGE, B.Sc., F.C.S.

E. RILEY, F.C.S.

T. STEVENSON, M.D., F.C.S.

A. NORMAN TATE, F.C.S.

W. THOMSON, F.C.S.

W. THORP, B.Sc., F.C.S.

W. A. TILDEN, D.Sc., F.R.S., &c.

T. TYRER, F.C.S.

W. WALLACE, Ph.D., F.R.S.E., &c.

R. WARINGTON, F.R.S., &c.

SECRETARY

C. E. GROVES, F.R.S., &c.

OF CHEMISTRY OF GREAT BRITAIN AND IRELAND. INSTITUTE

INCORPORATED BY ROYAL CHARTER.

STATEMENT OF ACCOUNT AND BALANCE SHEET,

FROM 1ST JANUARY TO 31ST DECEMBER, 1886.

PERCY F. FRANKLAND.	Audited and found correct,
	, , £3,500 3°/o Consols.
Fiabilities. December 31st, 1886 None.	Asstfs. December 31st, 1886, Cash at Bank £1,288 15 1
£1,750 17 4	£1,750 17 4
Current A/o 288 15 1 1,288 15 1	
	Interest on Consols 101 10 0 Examination Fees 21 0 0
Salaries and Wages 165 0 0 Parliamentary Agents 8 8 0 Mesera Markhy Stowart & Co. on a/c. of Charter 50 0 0	81 Fellows' Subscriptions 445 4 0 81 Associates' 32 11 0
	Entrance Fees 37 16 0 Life Compositions 37 16 0 45 3 0
Es. d. Printing, Stationery and Postage 88 13 7	E s. d. £ s. d. Balance in hand 1st January, 1886

H. H. B. SHEPHERD.

A. J. GREENAWAY.

Jan. 26th, 1887.

4

LIST OF OFFICERS & COUNCIL FOR 1887.

PRESIDENT.

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SIR FREDERICK ABEL, C.B., F.R.S., &c. H. E. ARMSTRONG, Ph.D., F.R.S., &c. SIR CHARLES A CAMERON, M.D., &c. A. DUPRÉ, Ph.D., F.R.S., &c. J. FERGUSON, M.A., F.C.S. E. FRANKLAND, Ph.D., D.C.L., F.R.S., &c.

TREASURER.

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R. WARINGTON, F.R.S., &c.

SECRETARY

C. E. GROVES, F.R.S., &c.



ADDRESS OF THE PRESIDENT

DR. ODLING, M.A., M.B., F.R.S., &c.

Delivered March 14th, 1887.

By the provisions of the Royal Charter under which the Institute of Chemistry was incorporated on the last day of June, 1885, it was required among other things that the Institute should with all reasonable expedition, by resolution of a General Meeting. make bye-laws for regulating the conduct of the affairs and property of the corporation; that the bye-laws so made by the Institute should not have effect until they had been submitted to and allowed by the Lords of Her Majesty's Privy Council; and that until the bye-laws had been so allowed, the affairs of the corporation should be conducted by the first appointed Council of the Institute in accordance with the Articles of Association of the original Institute founded in October, 1877, so far as they were not inconsistent with any express provision of the As regards the provision of the Charter declaring that the bye-laws of the Institute should not have effect until they had been allowed by the Lords of the Privy Council, I have the



satisfaction of being able to inform you that these bye-laws, as made by resolution of a General Meeting held on February 4th, 1887, confirmed at a subsequent General Meeting held on February 15th, 1887, received, so lately as February 24th of the present year, the formal allowance of the Privy Council; so that for the last fortnight, the conduct of the affairs of the Institute has had to be, and henceforward will have to be, in accordance with the bye-laws of the Institute, now made and allowed as required by the Charter.

The bye-laws of the Institute, thus given effect to, are in the main identical with those first made at a General Meeting of the Institute held so far back as March 26th 1886; and are based, as nearly as might be, on the Articles of Association of the original Institute. At different intervals since March 26th, three separate sets of suggestions and requirements have been put forward by the Privy Council; and though the successive consideration of these has had the disadvantageous effect of taking up a good deal of time, it must frankly be admitted that the careful criticism to which the bye-laws, as first made, have been subjected by the Privy Council, has resulted in their greater consistency and better fitness for their intended use. The final insistance by the Privy Council on one or two slight verbal alterations has caused indeed some little extra delay; but on most points their representations and requirements could not but be recognised at once as advantageous and called for; while on other points our counterrepresentations were eventually acceded to by them in a spirit of consideration and reasonableness demanding our thankful and hearty acknowledgement.

The bye-laws first submitted to the Privy Council, namely, those made on March 26th of last year, dealt with a proportion of the originally appointed Officers and Council of the Institute as ineligible for re-appointment by election of the Fellows, at the first General Meeting to be held under the bye-laws. It was pointed out, however, that this proposed ineligibility was contrary to the provisions of the Charter, which expressly declared the eligibility of the whole of the originally appointed Officers and Council for re-appointment by election. Thus it is that the

Officers and Members of Council now holding office, together with three other Fellows of the Institute who have been most largely approved as suitable to fill the vacancies which have occurred, present themselves for election at this, the first election held under the Charter and bye-laws. At every subsequent Annual General Meeting and election, however, one-third of the Vice-Presidents and Members of Council will, as heretofore under the Articles of Association, be ineligible for re-appointment. being required by the bye-laws that the holding of the election and Annual General Meeting should be on the 1st of March, or on some day between the 1st and the 15th of March, the meeting has, on this occasion, been put off until the latest included date. For the announcement of the meeting having to be made before the bye-laws had been formally allowed by Privy Council, it was thought desirable to afford the longest possible opportunity for their being so allowed before the time of holding the meeting; since in default of their being so allowed, the election of Officers and Council, which according to the provisions of the Charter can only be held under the bye-laws, and consequently not until after their allowance, could not have been held at the meeting at all, and must indeed have been postponed for another year. In future, however, it will probably be desirable to hold the Annual General Meeting and election as soon as may be after the 1st of March.

Under the provisions jointly of the Charter and the byelaws, the Council of the Institute has entrusted to it no inconsiderable powers. It constitutes, however, but the chosen executive of the entire corporate body, who are indeed the body responsible alike for the general policy of the Institute, and the regulation, broadly, of its affairs. The desirable continuity in any course of action pursued by the Council is provided for by the circumstance of two-thirds of its members being eligible for re-appointment at each successive Annual General Meeting. The desirable renovation of the Council, and its continuance in touch with the general body is provided for by the circumstance of the whole of its members vacating office every year; by one-third of the old members being ineligible for re-appointment; and by the official nomination of one-third of the new members being left in

the hands of the general body. The powers of the Council are, moreover, limited by the conditions that they are to be exercised in accordance with, and subject to the provisions of the Charter and bye-laws of the Institute; that they are to be subject also to the control and regulation of any General Meeting; and that they are not to be exercised in respect of certain matters such as the making of bye-laws and the purchasing or erecting of any building—which, under the provisions of the Charter, require to have the sanction of a General Meeting. Doubtless, it must and will happen from time to time that the action of the Council, determined on after consideration and discussion, of representations and counter-representations brought specially under their notice. may not have the approval of individual Fellows; but it will clearly be the fault of the general body, if the general course of action of the Council, subject as it it is in so many ways to their direction, is not in accordance with their prevailing wishes.

It should be fully understood that the Institute of Chemistry is essentially a professional organisation, having in view profesfessional objects. Its primary function is not the dissemination of scientific knowledge, but the assurance of scientific attainment. It is, indeed, the organisation of a highly scientific profession; probably the most, certainly one of the most, scientific of all existing professions. And its chief purpose is to ensure and improve the scientific training of those practising the profession, by setting up a high standard of scientific proficiency, and by certifying to the attainment of such a standard on the part of its registered members. As regards persons already in practice, its attestation must necessarily be based on the evidence available that they have, for not a few years, practised their profession with approved skilfulness and good repute. Such persons may well be depended on to maintain the character of the profession, and to justify the attestation accorded them. But it is with the future of the profession, as determined by the training and character of those entering its ranks, that the Institute is chiefly concerned. The gradual elevation and advancement of the profession in general, on the one hand by the educational and other demands made on every one admitted into the corporation, and on the other

hand by the inducement which admission to membership of the corporation will hold out to educated men, is the declared purpose for which the Institute was originally founded,—a purpose spoken of in the Royal Charter, under which it has since been incorporated, as "laudable and deserving of encouragement." Accordingly, in the case of all persons now entering the profession, not only are they required to show a practical familiarity with chemical operations as tested by the Institute itself, but they have in addition to furnish satisfactory evidence alike of general scientific training and general scientific attainment.

The Institute of Chemistry having been successively founded and incorporated with a view to the organisation and elevation of the chemical profession, it is to the achievement of this object that its efforts are properly directed; and it is by the more or less full achievement of this object that it must eventually claim to be judged. Despite many difficulties, owing in the first instance to the unsuitability of its constitution to the purposes and influences it aimed at effecting, and latterly to the transitional stage through which it has passed, it has admittedly achieved no inconsiderable amount of success. From this time forward, favoured by its Royal Charter, and acting now for the first time under its own bye-laws, it starts anew on its career, with a smoother course and more hopeful prospects than ever yet lay open before it. It prefers a claim upon all engaged in the profession of chemistry to interest themselves in its welfare, and to make its now completed organisation serviceable to good ends, and a means of advancing the profession to which they are attached, and of which they feel so justifiable a pride in being accounted members.

Unfortunately, the objects which the Institute of Chemistry is intended to subserve are not such as afford occasion for frequent personal intercourse, or for the circulation of beneficial printed communications among its Fellows,—means which habitually exert so large an influence in binding members of one and the same corporation to one another, and sustaining their interest in the corporation to which they in common belong. Requirements of education, examination, attestation, and registration, are not

matters habitually calling forth a strong enthusiasm of grateful But in default of any such enthusiasm, the Instirecollection. tute, especially in the still early stages of its career, prefers a claim on its members for steady, continuous accord and support. While carefully guarding the portals of the profession, it further aspires to safeguard the interests of those those admitted within the precincts. It is now to a considerable extent, it looks forward to being to a far greater extent, the means of assuring to the carefully trained and honourably conducted professional chemist, a recognised claim and position against which the unqualified and meretricious will feel it in vain to contend. Strongly desiderated, as it has been by many of the younger and more earnest of the profession, it appeals to the good-will and fostering interest of all; and of those, more especially, whose already assured position puts them personally beyond the scope and influence of its looked for usefulness and future success.

But the possession of adequate scientific qualification to enter a profession is one thing, the maintenance of high scientific qualification to practice the profession is another. The first named qualification, as the result of a special prescribed study, can alone be tested and attested by the Institute; the last named qualification is necessarily dependent on a voluntary perseverance in scientific study and a maintained interest in scientific progress. The advances of scientific chemistry are nowadays so rapid, and the development of applied chemistry follows so closely on the heels of scientific discovery, while pointing the way to yet further discovery, that the professional chemist, more perhaps than any other professional man, is placed in the happy position of being bound throughout his life to continue a student of science, and a contributor in one way or another to its advance-A student, if only for his own sake, he must be; a teacher ment. he may be, and on many grounds it is desirable that, in some cases, he should be. With but few exceptions, some of them it is true very eminent exceptious, the leading chemists of the country are the holders of professorial positions; and would it be other than a loss to professional chemistry, and to the many great interests committed to the care and judgement of professional chemists, if practitioners and professors were to be, from the

first, and throughout, broadly marked off from one another? Would it, for example, be for the public advantage, that Professor Williamson, Professor Frankland, Professor Roscoe, Professor Tyndall, Professor Dewar, and others, should be debarred from affording their professional services to the Board of Trade, to Royal Commissions, to the Judicature, to the Trinity House, to the Home Office, to the Board of Works, to the Board of Inland Revenue, and to other municipal or state departments? Would it again be for the public advantage, that the chemists exclusively engaged in these and other departments should, in particular cases of difficulty and doubtfulness, be unable to have the professional co-operation of their professorial brethren; that the men eminent for highly specialized knowledge, should in their responsible positions be refused, from time to time, the desired co-operation of men with a different and wider range of knowledge? Would it be for the advantage of the many large interests confided to them that the body of professional chemists throughout the land, should be a body wholly apart from, and not amenable to the influence of association on an equal footing with, the holders of professorial positions, and recognised leaders of chemical thought in the country?

On the other hand, the gain to professorial teaching and even to investigation, from the occasional engagements of the professoriate in various branches of professional work, would seem not to admit of question. Technical chemistry is the necessary and friendly illustrative of general chemistry; and such a knowledge of technical chemistry as is only to be acquired by the responsible conduct from time to time of technical inquiries, is by no means the least essential item of knowledge demanded in professorial teaching. General chemistry, while distinct from technical chemistry properly so called, has this in common with it, that it comprises a study of all the more important chemical changes taking place or effected, on a large scale, in the different processes of nature and art. It is necessary for the student to complete his chemical education by being made acquainted with these different changes and processes viewed as chemical phenomena; since by their study he is enabled to acquire a far better understanding of the nature and results of chemical

change, than he could possibly get by a study of laboratory processes only, conducted mostly on a small scale and with a different object. The teaching of scientific chemistry is not meant only or chiefly for those of independent means, who throughout their lives are to be exclusively students and inquirers; but is meant in large measure for those who, in some way or other, are to make their study of the principles of chemistry available for their own needs, and directly contributory to the prosperity and productiveness of the country. It is for the professor of chemistry, by that familiarity with technical operations which is attainable only by occasional participation in them, and responsibility with regard to them, to make himself qualified to direct the pupil in his scientific study of technical processes, considered as among the largest and most important illustrations of chemical change. In many ways, indeed, it is for the advantage of those whom he teaches, that he should not hold himself aloof from the professional pursuits for which the majority of them are qualifying themselves under his instruction and guidance. The question is not between a teacher fulfilling the special duties of his chair assiduously and earnestly, or perfunctorily and indolently; for among not the least active and renowned of teachers, have been found those largely engaged from time to time, and in one way or other, in professional work. But the question is, assuming the attention of the teacher to be available in some measure for other duties, whether his duly paid for occasional engagement in the work of technical inquiry is not at least as cognate and professorially improving, as his alike paid for, more or less continuous, engagement in the not over edifying work of examinership, secretaryship, directorship, editorship, hack-authorship, and so forth. To be engaged in the profession of surgery, of medicine, of law, of engineering, and of fineart, &c., is an almost essential requirement of the professor of each of these subjects; and to be engaged in the profession of chemistry, cannot, it would seem, be otherwise regarded than as a valuable contributory qualification of the professor of chemistry. In support of this position, I would invite your attention to the substance of a letter communicated some time back, by Professor Frankland, to "The Chemical News." As this letter (see, Appendix) was called forth by way of reply to an elsewhere-appearing, alike

foolish and rancourous attack on the Institute, to which it is not worth while to accord the importance of more than a passing mention, I have persuaded Professor Frankland, here and there, to alter the wording of his letter, excluding from it, as far as could be, all animadversion on the little ebullition of editorial pique, to which it was only too serious a rejoinder. For editors, even professoreditors, "however they have writ the style of gods," have yet their besetting frailties; tall-talking rather than plain-dealing being, indeed, their too delightful privilege, and ever fondly resorted to weapon, serving them both as sword and shield.

In common with other great gifts, the power of making important contributions to knowledge and doctrine is, in its very nature, a rare power. Whatever his desires, opportunities, and efforts, it is not given to every one to be a great discoverer. to every member of a scientific profession it is given to do good and useful work in science, and in the applications of science. More especially it is incumbent on the professional chemist to be not unmindful of, nor is he found to be unmindful of, the special opportunities afforded him. By his function and training, he would seem to be of necessity an investigator; since to analyse necessarily implies to investigate. Always indeed should it be borne in mind that the varied work of the professional chemist, in its different degrees of magnitude, responsibility, and originality, is essentially scientific work, claiming to be conducted in a scientific spirit. As but few among us can be in, or near, the first rank of discoverers, so neither can many of us be holders of the first professional positions, and doers of the most dignified and highly remunerated professional work. But as it is for the youthful, the little heard of, and the struggling worker to pride himself on belonging to a definite learned profession, including in its ranks the most eminent and revered of his masters in science, so it is for every one, no matter how high his position, who is, or has been, engaged in any way in professional chemistry, and takes interest in the professional career of his pupils and successors, to recognise the tie which binds him and his fellow workers together. for all alike to acknowledge a mutual claim on each other's consideration and good will, and a common obligation to the now organised profession of which all alike are members.

Appendix of Dr. Frankland's letter, reprinted, with some alterations, from "The Chemical News" of December 18th, 1885.

THE INSTITUTE OF CHEMISTRY.

TO THE EDITOR OF "THE CHEMICAL NEWS."

Sir,—In the number of "Nature" for the 26th of November last, there appeared an editorial article headed "The Whole Duty of a Chemist," containing criticisms on the scope and objects of the Institute of Chemistry. In common with others, I have felt surprise and regret at the numerous misstatements contained in the article, and at the tone adopted throughout the reproof which the writer has "felt it his bounden duty" to administer to the Members of the Institute; and as I have been associated with, and greatly interested in the progress of the new organization from its foundation, and have felt the great need for a definite bond associating chemists in a common work, for the improvement of the training and education of professional chemists, for the raising of the standard of professional work, and for the promotion and encouragement of a uniformly high tone and spirit in its performance, I will ask you to give me space to defend the Institute against the gross misrepresentations contained in "Nature," since the editor has thought fit to close his journal against my criticisms.

The editor of "Nature" implies that, in common with "all true men of science," he considers the creation of the new Chartered Corporation as an event quite beneath notice in his journal, except on account of the interest resulting from the "consideration of its prospective influence on the progress of science." He seems to think that there can be nothing great, noble, or truly beneficial for mankind, except original research. The physician, surgeon, and engineer, whom he classifies with the tailor and bootmaker, may be respectable members of society, but they are quite beneath the notice of the "student of pure science." They are unworthy of his sympathy or gratitude, however much their knowledge and skill may benefit their fellowmen, inasmuch as they make a livelihood by their several professions,—a grotesque representation of the relative positions of investigators and professionals, not calculated to commend itself to either class.

The Institute does hope to do for its members what the College of Physicians and the College of Surgeons have done for theirs, by formally

including them within the ranks of a learned profession; while the world at large must benefit by the setting up of a high standard of scientific knowledge and proficiency. Its object is certainly not, as the writer states, that of the "modern trades-unions." The President distinctly and truly said in his address, "It does not lay itself out, nor is it fitted, for the exercise of what may be called a trades-union method of proceeding." It is not true, as stated in the article, "that the intention is entirely commercial." On the contrary, its chief intentions are educational and ethical. The editor of "Nature" is pleased to pronounce the medical education of the day as the "worst organised and least effective." Even admitting this to be the case, which I am far from doing, surely its improvement would not be promoted by abolishing all organisation, and leaving medical students to develop into practitioners simply according to their own inclinations. Such was the condition of things in the chemical profession before the foundation of the Already, however, its action has very materially raised Institute in 1876. the standard both of special and general training amongst those who have presented themselves for examination; and several original investigations have been made by candidates with special reference to their admission to the Associateship. The rapid increase in the number of applications of chemistry to agriculture, manufactures, public health, the service of the State, and the daily wants of modern civilisation, has, for many years past, conferred upon professional chemistry an importance scarcely second to that of other professions which have been similarly called into existence by the urgent wants of society; and, like them, it required organisation and suitable scientific training for its creditable and successful practice.

The curriculum prescribed for the lower degree of Associate, includes a thorough training in theoretical and practical chemistry,—an original research, conducted by the candidate, being considered a specially high recommendation. In addition, he is required to pass satisfactory examinations in physics and mathematics, and is always specially examined by the officers of the Institute in practical chemistry. This examination, which extends over several days, is conducted in properly-equipped laboratories by the following official examiners: Prof. W. A. Tilden, D.Sc., F.R.S., for Birmingham; Prof. Ramsay, Ph.D., for Bristol; Prof. W. N. Hartley, F.R.S., for Dublin; Prof. E. J. Mills, D.Sc., F.R.S., for Glasgow; Prof. Charles Graham, D.Sc., for London; and Mr. Watson Smith for Manchester. These are names of world-wide reputation, and I leave your readers to judge how far an institution having such objects, performing such functions, and including in its register the name of nearly every chemist of eminence in the United Kingdom, deserves the contempt and reproach with which it has been assailed in the columns of "Nature."

Unlike the editor of that journal, I consider that the President of the Institute was particularly happy in his delineation of the status and character of the professional as distinguished from the professorial or tutorial man of science. There is a great deal of flabby sentimentalism abroad in

reference to the earning of fees by scientific men, and it was high time that its hollowness should be exposed. It is said that this sentimentalism has even in some cases taken the form of so drawing the conditions of appointments as to prohibit the occupants of professorial chairs from taking part in any technical inquiry, however important. It is my deliberate conviction that this complete divorce of science from practice is most disadvantageous to the man of science, to the national welfare, and even to the progress of scientific investigation. Such a prohibition effectually cuts off the professor from one of the most important and valuable sources of scientific knowledge, and decidedly impairs his capacity for teaching, inasmuch as it deprives him of the opportunity of acquaintance with the most recent applications and problems of science. Without travelling beyond the United Kingdom, I may mention the names of Faraday, Graham, Brande, Miller, Gregory, Anderson, Stenhouse, Brodie, Kane and Hofmann as those of men who have all applied their science to the utilities of the day, and have received honourable payment for the same; and whilst thus affording valuable aid to others, they materially widened and deepened their own As for my own experience, the training I have scientific knowledge. received from work of this kind has been of inestimable service to me, not only as a teacher, but also as an investigator, for it has suggested several enquiries which were subsequently pursued in my own laboratory.

The editor of "Nature" waxes grandiloquent over the high dignity of the investigator, and asserts that the endowment of research is not for the benefit of the researcher. As a matter of fact, however, researchers have been, and still are, endowed from the National Exchequer to enable them to live whilst making their investigations, It is well known that original investigation is a source of the greatest pleasure and delight, and taking this into account, I have heard an eminent discoverer, now on the Bench, say that instead of being endowed, researchers ought rather to pay for this the highest gratification of their wishes. This is no doubt an extreme view, but I can scarcely imagine a greater "benefit" to the researcher than having his sustenance and expenses provided for him by others, in order that he may devote himself to his favourite pursuits. I am not deprecating the endowment of research. Much may be said on both sides of this subject, and when you catch your great discoverer, it is undoubtedly for the national good that he should be endowed. On the whole, however, I agree with the President that the "best of all endowments for research, is that with which the searcher, relying on his own energies, succeeds in endowing himself."

The writer's remarks on experts are perhaps not altogether undeserved, but the fault is by no means entirely theirs, and is to be attributed much more to the state of the law relating to their evidence. So far as the fault rests with the expert, it is the duty of the Censors of the Institute to deal with it. Every unprejudiced person will admit that the more extensive and accurate knowledge, and the higher tone which our corporation seeks to promote, must tend to its rectification; whilst the "not too much knowledge or conscience," which the editor of "Nature" consoles himself in thinking

are amongst the most valuable qualities in an expert, would as certainly tend in the opposite direction. Experts are, however, rare in the Institute; the great mass of its members consists of chemists in factories, public analysts, and chemists in Government departments and in the employ of the corporations of our large towns. These are supplemented by professors, teachers, manufacturers and others, who consider that the better training of young chemists, most of whom must of necessity earn their livelihood by the exercise of their profession, is an object which it is desirable to encourage.

Of the hundreds of chemists who are annually turned out of our laboratories more or less educated, few can become State-endowed researchers. Is it not to be wished that the large residue should be well educated and properly trained for the work they have to do in the world? To some of them problems will be submitted involving the success or failure of large industries; and upon all of them, who follow their profession, will rest the duty of maintaining, so far as chemistry is concerned, our national supremacy in arts and manufactures. Those of them endowed with the true spirit of research will rarely fail to find time for an occupation which promises them the keenest pleasure. It would indeed be well if those who inherit wealth would qualify themselves for the investigation of Nature; but, unfortunately, this is rarely the case, and hitherto the progress of science has depended mainly upon the work of men who have had to earn their own livelihood.

Reasoning from the fact that the medical profession, in consequence of its scientific training, has very largely recruited the ranks of investigators, it is not too much to expect that the Institute of Chemistry, with its far more specialised curriculum, will at least equally distinguish itself by the evolution of experimental inquirers. It must be borne in mind, however, that besides original research, there are other things in the world which deserve the support and encouragement of the man of science; and whilst yielding to none in our estimate of the great value of research, we must not forget that it is by no means "the whole duty of a chemist."

I am, &c.,

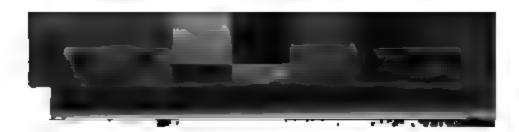
E. FRANKLAND.

THE YEWS, REIGATE,

December 12, 1886.



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INSTITUTE OF CHEMISTRY

OF

EAT BRITAIN AND IRELAND.

PROCEEDINGS.

PART II. 1887.

Zondon :

ITED BY A. P. BLUNDELL, TAYLOR & Co., 26, GABLICK HILL, CANNON ST., E.C.



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AT a MEETING OF COUNCIL, held at Burlington House on Friday, the 22nd day of April, 1887, it was resolved "That the Secretary be instructed to have a List of the Fellows and Associates of the Institute printed in pamphlet form as a REGISTER, and issue the same to the Members as part of the 'Proceedings.'"

Fellows and Associates are requested to send immediate notification of change of address to the Secretary.

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Carmody, Patrick, Laboratory, Somerset House.

Carnelly, Thomas, D.Sc., F.C.S., University College, Dundee.

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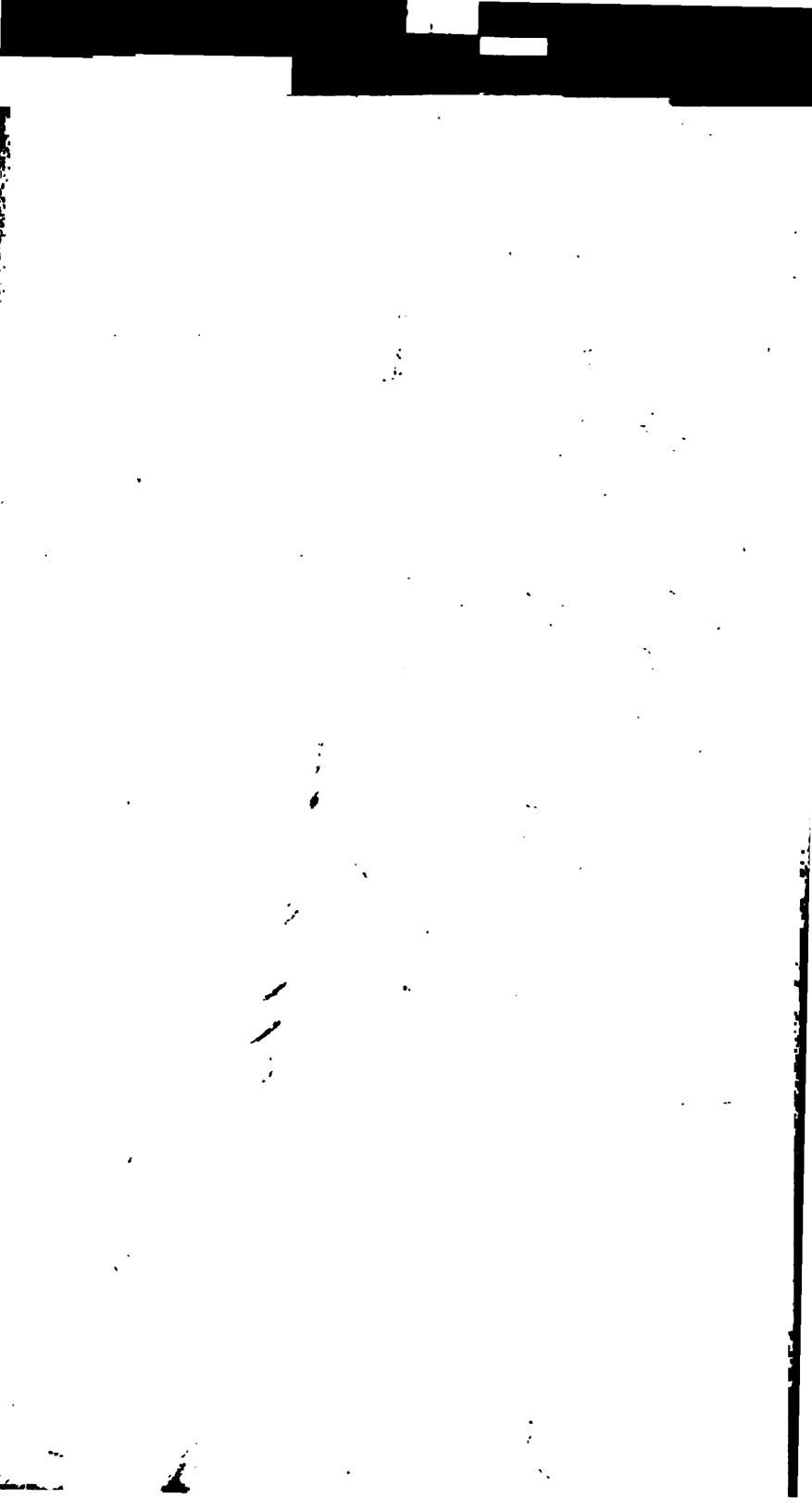
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INSTITUTE OF CHEMISTRY

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PART I. 1888.

REPORT OF THE ANNUAL GENERAL MEETING,

BALANCE SHEET FOR 1887,

AND

ADDRESS OF THE PRESIDENT,

Professor ODLING, M.A., M.B., F.R.S., &c.

Zondon:

PRINTED BY A. P. BLUNDELL, TAYLOR & Co., 177, UPPER THAMES ST., E.C. 1888.



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REPORT

OF

ANNUAL GENERAL MEETING.

- THE SECOND ANNUAL GENERAL MEETING of the Institute of Chemistry of Great Britain and Ireland, as incorporated by Royal Charter, was held at Burlington House on Thursday, the 1st March, 1888.
- The Balance Sheet (see p. 4) having been laid before the Meeting by the Treasurer, the President delivered his Address.
- The REPORT OF THE COUNCIL was then read by the Secretary as follows:—
 - The Council has to report that since the last Annual General Meeting 158 Fellows and 22 Associates have been admitted to the Institute. Of these a large proportion have been admitted, without examination, under the powers conferred on the Council by the Royal Charter. At present there are 544 Fellows and 45 Associates on the Register.
- The Report of the Council having been received and adopted, the Officers and Council for the ensuing year were elected (see p. 5,) Messrs. E. G. Clayton and J. Holmes acting as Scrutineers.
- The CENSORS elected were Sir Frederick Abel, Dr. E. Frankland, Dr. W. Odling, and Dr. W. J. Russell.
- Mr. C. E. Cassall, Mr. Bernard Dyer and Mr. H. J. Helm vole appointed Auditors.

INSTITUTE OF CHEMISTRY OF GREAT BRITAIN AND IRELAND.

INCORPORATED BY ROYAL CHARTER.

STATEMENT OF ACCOUNT AND BALANCE SHEET.

FROM 1ST JANCARY TO SIST DECEMBER, 1887.

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:						CHARLES E. CASSAL,			

PERCY F. FRANKLAND,

H. J. HELM.

Jan. 17th, 1888.

Andited and found correct,

LIST OF OFFICERS & COUNCIL FOR 1888.

PRESIDENT.

JAMES BELL, Ph.D., L.L.D., F.R.S., &c.

VICE-PRESIDENTS.

SIR FREDERICK ABEL, C.B., F.R.S., &c.
H. E. ARMSTRONG, Ph.D., F.R.S., &c.
SIR CHARLES A CAMERON, M.D., &c
J. FERGUSON, M.A., F.C.S.
W. ODLING, M.A., M.B., F.R.S., &c.
C. M. TIDY, M.B., F.C.S., &c.

TREASURER.

DAVID HOWARD, F.C.S.

ORDINARY MEMBERS OF COUNCIL.

A. ALLEN, F.C.S.

BERNAYS, Ph.D., F.C.S.

H. T. BROWN, F.C.S.

M. CARTEIGHE, F.C.S.

P. CLOWES, D.Sc., F.C.S.

T. FAIRLEY, F.R.S.E., F.C.S.

A. E. FLETCHER, F.C.S.

FRANKLAND, Ph.D., F.C.S,

W. HARKNESS, F.C.S.

OTTO HEHNER, F.C.S.

D. B. HEWITT, M.D.

P. R. JAPP, M.A., Ph.D., F.R.S., &c.

GEORGE H. MAKINS, F.C.S.

R. MELDOLA, F.R.S., &c.

B. E. R. NEWLANDS, F.C.S.

C. O'SULLIVAN, F.R.S., &c.

J. PATTINSON, F.C.S.

W. RAMSAY, Ph.D., F.C.S.

E. RILEY, F.C.S.

W. R. SMITH, M.D., D.Sc.

T. STEVENSON, M.D., F.C.S.

A. NORMAN TATE, F.C.S.

J. M. THOMSON, F.C.S., &c.

THE PROPERTY THE CO

W. THOMSON, F.C.S.

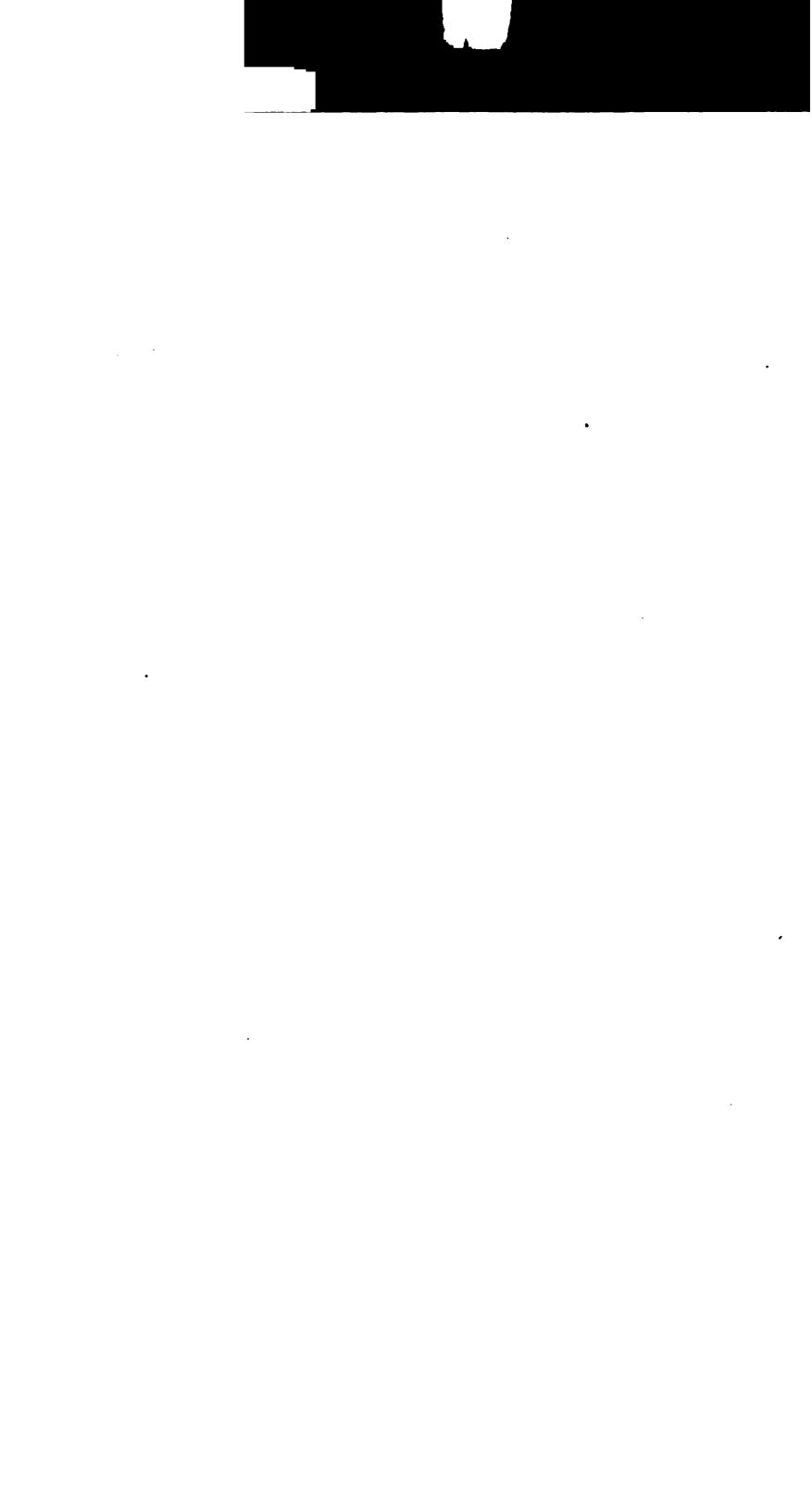
W. A. TILDEN, D.Sc., F.R.S., &c.

T. TYRER, F.C.S.

R. WARINGTON, F.R.S., &c.

REGISTRAR AND SECRETARY.

C. E. GROVES, F.R.S., &c.



ADDRESS OF THE PRESIDENT,

Prof. ODLING, M.A., M.B., F.R.S., &c.

Delivered 1st March, 1888.

In the anniversary address which it was my privilege to deliver a twelvemonth ago, I was able to announce to the Fellows and Associates then present, that the bye-laws of the Institute, as made, revised, and confirmed at successive general meetings, held on or between March 26th, 1886, and February 15th, 1887, had, shortly before the occasion of our then anniversary, been rendered effective, by reason of their having received the formal allowance of the Lords of the Privy Council; and that, from that time forth, the conduct of the affairs of the Institute would have to be, as I need scarcely say it has since been, in accordance with the provisions of the bye-laws. These bye-laws, however, are far from being the sole or even the main authority under which the Institute of Chemistry carries on its functions as a chartered Even its authority to make bye-laws at all is limited by the conditions of the Charter; and it was for the Lords of the Council, among other things, to satisfy themselves that these conditions were strictly fulfilled. Accordingly, for a declaration broadly of the objects, constitution, and duties of the Institute, we have to look to the words of the Charter, wherein

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is accorded, among other powers, the power to make bye-laws, primarily for all or any of certain specific purposes set forth in the Charter; and then, more generally, such bye-laws as from time to time seem "requisite for the management and regulation of the affairs and property of the Institute, and the better execution of this our Charter, and the furtherance of the objects of the This last expression, "the furtherance of the objects Institute." of the Institute," has reference of course to its declared objects, as stated in the petition serving afterwards as the preamble of the Charter,—these objects being referred to in the Charter itself as "laudable and deserving of encouragement." One of these objects, and, indeed, the one most of all dwelt upon, is declared to be "the elevation of the profession of consulting and analytical chemistry;" and the strongest ground put forward, on behalf of our claim then being made for incorporation, is expressed in these words, that "besides other advantages such incorporation by Charter would be a public recognition of the profession of analytical and consulting chemistry, and would tend gradually to raise its character, and thus to secure for the community the existence of a class of persons well qualified to be employed in the responsible and difficult duties often devolving on them." Believing in the sincerity of the representations so made, namely, that our main object was the elevation of the profession, and that our incorporation as a chartered body would tend to effect that object, the coveted Charter, with power to make bye-laws, was after some consideration accorded us; and, by the allowance finally granted to our code of bye-laws, we were enabled to make our proper start, without further let or hindrance, a twelvemonth ago, so that we are now, as we were not until then, fairly

Being, however, thus fairly started on our way, it only remains for the members of the Institute to fulfil the obligation they have taken on themselves to make the elevation

of the chemical profession an object of real solicitude, and to render their at length completed organization serviceable towards the attainment of this end. Now that the Institute of Chemistry takes its place among the recognised professional associations of the kingdom, it is for the members to determine whether it shall take a prominent place,—whether or mot it shall take that place to which its character as the embodiment of one of the most scientific of all professions entitles it. Every professional association has the special conditions of its wn craft to take into consideration, its own special advantages to make good use of, and its own special difficulties to contend with. But all professional associations, old and new alike, would seem to have this in common, that they owe their ultimate success and influence, in large measure, to those who, taking a high view of their profession, believed in and worked for its future, and discarding ignoble motives, were determined, that come what might, that future should be a progressive and a distinguished one. Admitting, as we must, that human action is ever the result of mixed motives, from which the great motive of self-interest canmot, as it ought not, to be excluded, there is yet all the difference in the world between an intelligent and widely sympathetic selfinterest on the one hand, and a low and confined self-interest on the other; between the self-interest which is consistent with the desire and ambition to effect a common good, and the narrow self-interest which looks only to a present and purely personal gain. That the Institute of Chemistry, developed in a liberal and enlightened spirit, may and will become the means of conferring real benefits upon those engaged in the practice of professional chemistry—that it will at any rate achieve for its members no less of good than other well-regarded professional associations have achieved for theirs—does not, I think, admit of question; and on this point I propose to say a few additional words further on. But it was never intended to effect advantages of a purely personal kind; and in justifying the claim which we made to be intrusted

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with a Charter, the idea that we had any such personal advantages in view was only mentioned to be at once repudiated. By our acceptance of the Charter, granted as it was in the terms of our own application, we are pledged to make the Institute subservient to public and not to private ends. But alike on public and private grounds, we desire to make it a respected and influential organisation, not unworthy of the eminently scientific profession which it claims to represent. Great and powerful institutions, however, are not to be looked for as the outcome of paltry aims, but rather of earnest single-minded effort on the part of those animated by the sense of a high and worthy purpose to be accomplished.

The Institute of Chemistry differs from, at any rate, the greater number of professional societies in this, that its organisation was from the first, as it still is, essentially democratic. The majority of these societies have been, not a few of them still are, more or less oligarchic. They were founded and fostered, for the most part, by men of mark in their several professions, fully conscious of their own powers and attainments, earnest and high-minded beyond all question, but a little perhaps out of sympathy with the rank and file of their brethren. most of the older societies, and in several not so old, the rank and file have had to fight their way, not so much for corporate equality as even for recognition. In the foundation and conduct of the Institute of Chemistry, this condition of things has not obtained, or rather has been almost reversed. Not indeed without the hearty co-operation of several of the more prominent of our body, the original association founded in 1877, of which the present Institute is the outcome and development, was originated mainly by the then younger and less prominent men among us. And the idea, from the first, was, the comprehension of all engaged in the different departments of chemical work, on a footing of corporate equality. It was in accordance with this idea of the union of the entire existing profession, that so soon as we were

■ble to act under our bye-laws, a general announcement was made of our desire to associate with ourselves, to whom the charter was primarily granted, all qualified professional chemists in practice throughout the country, who reciprocally had a desire to associate themselves with us. It is not to be denied that the step thus taken, though supported by a weighty preponderance of favourable opinion, has been objected to by several individual Fellows. It was felt, however, that the Charter of Incorporation was intended for the benefit of the entire profession, and that its use in any spirit of exclusiveness, by those to whom it was primarily granted, would be not only unwise, but altogether unjustifiable. Anyhow, the step has been taken; and with the result that our corporation has been increased by an addition of about two hundred new members, whom I beg to assure we are heartily glad to welcome among us. Thus reinforced by combination, it remains for us all, old and new members alike, to bear in mind the avowed paramount object of the Institute, namely, "the elevation of the profession of consulting and analytical chemistry." It is for us to show that the members of a profession organised like our own, in which the entire body is self-governing, are not less mindful of the real and permanent interests of our profession than are the oligarchic few who, in so many instances, constitute the governing bodies of other professional societies. our case, it is for the self-governing many to show a like spirit of earnestness and high purpose to that manifested in other cases by the exclusive few; who, stimulated by the sense of their position and responsibility, have devoted themselves with so much persistency and zeal to raise their respective societies to the height of influence and reputation which several of them at present enjoy.

As in other societies, the executive Council of the Institute of Chemistry is subject to an annual excision and filling up of its numbers. Every year one-third of the Vice-Presidents, and one-third of the ordinary Members of the Council become

ineligible for re-election. The formal nomination of the new Vice-Presidents, and of the greater part of the new ordinary Members of Council, rests, as in all other societies, with the preexisting Council; and I venture to think advantageously so. In filling up their list of nominations, the Council, purposely met to deliberate on the matter, have to take into account, and do take into account, a number of more or less conflicting considerations, —the object to be aimed at being clearly the selection of a Council as thoroughly representative and useful as possible. Thus it is obviously desirable that the Council should include representatives of the several divisions of the United Kingdom, or, in other words, that Scotland and Ireland should not be forgotten; as neither should, apart from the question nationality, the great provincial centres of chemical industry, as Glasgow, Newcastle, Manchester, Liverpool, Birmingham, and Bristol. It is clearly desirable also to include prominent representatives of the different scientific or professional societies, with whom we are most closely in association, as the parent Chemical Society, the Society of Chemical Industry, the Society of Public Analysts. and the Pharmaceutical Society. Again, the multifarious departments and varieties of professional chemistry have to be considered. Professors and teachers of chemistry, to whom we look for our succession of associates; chemists occupying official positions of all kinds; chemists to works and mercantile associations of different kinds; chemists engaged chiefly in the analysis of various commercial and manufacturing products; chemists engaged chiefly in consulting practice; chemists who have not, and chemists who have previously served on the Council; and, above all, those who, interesting themselves warmly in the success of the Institute, possess the knowledge and experience of affairs which makes their co-operation in the work of the Council preeminently advantageous. These and such-like considerations are discussed and acted upon at the meeting of Council, at which, after due notice, the selections for nomination are made by

ballot,—I would have said at the usually full meeting of Council, but for the circumstance that all our meetings of Council are usually full meetings.

From the number and variety of not always obvious considerations involved, it is likely enough to happen that the selection made by the Council, though susceptible of easy justification, may not always justify itself on mere inspection. regard, however, to the different interests that have to be taken into account, it would seem, I think, to most, that the nomination of new Members of Council is better thus left in the hands of some two dozen or more responsible persons, mecessarily representative of various departments of chemical work, rather than to the hap-hazard nomination of scattered individuals, or to the joint nomination, with a view to some sectional object, of some particular group of members. other hand, any body of men who constitute an executive Council, with the power of nominating to the statutable vacancies created in their body, are admittedly liable, however unconsciously, to act in a greater or less degree under a feeling of clannishness; and are yet more liable to suffer under the imputation of so acting. To counteract this tendency, so far as it may exist, and still more to maintain a common interest and feeling of mutual confidence between the Council and the general body of the Fellows, a special provision has been made in the bye-laws of the Institute, which is not, I think, to be found in the bye-laws of any other corporation. By this provision, while the formal nomination of two-thirds of the new ordinary Members of Council is left in the hands of the pre-existing Council, the formal nomination of the other third is left in the hands of the general body of the Fellows. And by exercising this right year after year, as it is advisable it should be exercised, the outside body of Fellows become the nominators of one-third of the ordinary Members of Council or of one-fourth of the entire Council,—this one-third or one-fourth having further

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its proportionate voice in the selection by ballot of the members primarily nominated by the Council. Considering the variety of interests that have to be taken heed of by the Council in making their primary nominations, necessarily of persons not at all likely to think or act in unison with one another, it is evident that the power of the outside body of Fellows to nominate one-third or one-fourth of the Council gives them a very influential, if not indeed a preponderating voice in its deliberations. As a matter of experience, there has not been found any party division, or general difference of view, between Members of Council nominated by the general body of Fellows on the one hand, and those nominated by the pre-existing Council on the other. But supposing such a division on party lines to exist, and the nominees of the general body to have been out-voted or treated with scant consideration, in respect to some question regarded as of importance which they had formally brought under the notice of the Council, they might under such circumstances justifiably, and I think only under such circumstances, hitherto quite hypothetical, make their appeal to the general body; and a little consideration will suggest how such an appeal should, and how it should not be made. It cannot be too fully recognised that the entire body of members of the Institute constitute the governing body of the Institute, and that the Council form only the administrative executive. It is of course open to each individual Fellow, and still more to any set of Fellows, to bring under the formal consideration of the Council, any view or proposal in which they are interested; nor are they bound to acquiesce in its rejection by the Council, should it so fall out. On any matter deemed of sufficient importance, whether or not previously brought under the notice of the Council, it is in the power of any twenty members of the Institute to have a general meeting called to consider such matter; and, after all sides have been fully heard, to express thereon a decision which it is imperative on the Council to give effect It is for the general body of Fellows to consider whether this

method of proceeding, specially provided for in the bye-laws, is not more straightforward and befitting than any kind of attempt, by means of ex parte representations, to pack a Council with the advocates of some particular view or sectional interest. course, for the general body to select whomsoever they please as the Officers and Council of the Institute, and circumstances are conceivable in which they might be warranted in a more or less wholesale rejection of the Council list; but having regard to the mode of constitution of the Council, the duties imposed on them. and the support to which they are entitled in fulfilling these duties, such a proceeding would seem to be justifiable only as a last resource, and on some specific grounds of unwise or wrongful action, held to be such by an undoubted preponderance of opinion among the Fellows as a whole. I have enlarged on this topic more fully than I otherwise should, from the strong feeling I am under as to the paramount necessity of maintaining a sense of common interest and purpose between the Council and the Fellows With all the failings naturally incident to a system of virtual co-optation, it is yet clear that the duty of making nominations to the Council is a charge for which some set of persons, possessing the confidence of the Fellows in general, must be responsible; while by means of the special provision, requiring the acceptance by the Council of outside nominations to the extent of one-third the number to be made, any section of the Fellows deeming themselves insufficiently represented, have it in their own power to supply the deficiency.

To revert once more to the preamble of the Charter, it is therein declared—"That the said Institute was not established for the purposes of gain, nor do the members thereof desire or seek any pecuniary profit from their membership; but the society aims at the elevation of the profession of consulting and analytical chemistry, and the promotion of the efficiency and usefulness of persons practising the same, by compelling the observance of strict

rules of membership, and by setting up a high standard of scientific and practical proficiency." The Institute of Chemistry being now fairly on its way, it is in the power of the general body of Fellows to make it almost anything they please. They may, if they choose, although in despite of the spirit of the Charter, allow it to degenerate into a very inefficient sort of trades-union; or they may more wisely, as well as more rightfully, resolve upon its being so conducted as to raise it to a position of influence and reputation not inferior to that of any existing professional society. Such a result, indeed, is not to be accomplished without continuous effort, and possibly even a little self-sacrifice. I do not, of course, speak merely of the pecuniary contribution, now reduced to a very modest figure, which, in order to carry on the work of the Institute, we require to exact from our members. But even with regard to this contribution, the fitting question for the contributor. I take to be, not what does he himself get in return, but in the promotion of what common good does he bear his part. Anyone who permits himself to entertain the question, "What do I get for my guinea?" must, I fear, be regarded only as an encumbrance, and a hindrance to the cause which the Institute of Chemistry was avowedly founded to aid and bring into success. To those of us who are able to look back a score of years and upwards, there are few things more noticeable than the widespread development of Professional Chemistry which has taken place within the last quarter of a century. It is still the case, however, though in a less degree than formerly, that certain of the more lucrative branches of professional work are, to a large extent, in the hands of a comparatively small number of persons, whose professional success has further achieved for them no little degree of personal consideration. Socially, they have been recognised as able to hold their own, in every way, with the most eminent representatives of other professions, whether of engineering, or law, or medicine, or literature, or art. That these of our colleagues have done so well for themselves is a matter of congratulation: but they

have done much more than that. They have contributed to found, and obtain recognition, for the profession in which they are eminent; whereby no small gain has been achieved for the members of the profession at large. The ever-increasing demand for the services of professional chemists involves necessarily an increase in the sum-total of distributable gain; but we may now look forward also to its more widespread and equable distribution. When it becomes recognised, as it is becoming recognised, that professional chemists, whether scattered throughout the country or accumulated in particular centres, are alike members of a definite learned profession; that, in point of character, cultivation, and training, they have little or nothing to concede to one another; and that the professional guarantee of conduct and capability is the same for one as for another, it will follow necessarily that much of the work now entrusted mostly to a prominent few will become distributed among a more numerous set of persons, recognised as belonging to the same corporate body, and certified by that body to be no less capable of carrying out the work entrusted to them. however, suggested for a moment that the higher and more general estimation accorded to the status of the professional chemist, which the action of the Institute is calculated to bring about, will be altogether limited in its effects to members of the Institute. The benefit accruing from its action is not of such a kind that those who decline to associate themselves with us will find themselves wholly excluded from participation therein. still, as the joint influence and reputation of the Institute extends, as we mean that it shall extend, they will, however competent, undoubtedly find themselves more and more heavily handicapped in the race. For however special, in particular instances, may be the work of the professional chemist, and however secluded and self-sufficing may be his habits and nature, occasions will arise in which his work, and views, and interests will come into collision with those of others; and in which the circumstance that he is not recognised by the great body of his profession as

one of themselves, will be likely to tell heavily against him. On the other hand, all of us are liable at times to find ourselves in circumstances of professional difficulty and anxiety,—circumstances in which the sympathy and co-operation we are able to claim from those with whom we are associated as members of a common professional body, are calculated to afford us no little solace; while the consideration shown to us on all hands, by reason of the professional position we are recognised to hold, may even furnish us a material support. Having regard, moreover, to the many occasions in which professional chemists have to co-operate with or oppose one another, there can be no doubt that their co-operation is rendered more hearty, and their opposition to one another more temperate and kindly, by the circumstance of their owning a common allegiance to, and taking a common interest in, the professional corporation of which they are alike members.

As regards the means by which "the elevation of the profession of consulting and analytical chemistry" may be best promoted, the particular means chiefly dwelt upon in the Charter is the requirement of evidence from all persons, hereafter desirous of entering the chemical profession by becoming successively Associates and Fellows of the Institute of Chemistry, that they have undergone a thoroughly efficient training; and that they possess both a practical and scientific knowledge of the subject of their professional work. To what extent the requisite training can, or cannot, be satisfactorily afforded and guaranteed in private laboratories is a question on which I forbear to indicate any opinion; more especially as the matter is not one that has come under the formal notice of the Council during my tenure of office. It is likely, however, to be brought before long under the notice of the new Council; who will, I feel sure, be prepared to give it their most considerate attention, and to deal with it in a spirit of liberality, and of thoughtfulness for the best interests of the Institute and of its present and prospective members. But quite irre-

spectively of whatever conclusion may be come to on this vexed question, and in view of the fact of our requiring from our associates a high degree of scientific as well as of practical knowledge, we must all recognise, as a matter for congratulation, the warm interest taken in the success of the Institute, by the professors and teachers of chemistry at our different universities, colleges, and schools. We are under no small indebtedness to them for directing the attention of their classes to the advantages resulting from admission to our associateship, and for encouraging and enabling the most promising of their students to fulfil our examinational and other requirements. The strongly held opinion, becoming more and more prevalent among educational bodies generally, that mere examination, however carefully conducted, does not of itself afford a satisfactory guarantee of knowledge and training, would seem to have a more especial warrant in the case of almost all subjects of practical and professional study; and is one with which the Council of the Institute is heartily in And, as regards our future Associates, indeed, it is hoped that with the co-operation of professors and teachers, means may be found of supplementing the evidence of attainment now afforded by examination, by further special evidence of training obtainable by certified records of laboratory work gone through.

Passing to another topic, the suggestion has frequently been made that, partly with a view to bringing the members of the Institute into more of personal communication with one another, and partly with a view to effecting advances in the knowledge of those branches of applied chemical science with which the professional chemist is chiefly concerned, occasional meetings of members of the Institute might advantageously be held, at which subjects of interest should be brought forward, in the form of papers or otherwise, and be considered and discussed at the meeting. There is admittedly nothing inconsistent in a professional society taking upon itself the additional functions of a scientific and publishing

society; while, as to the desirability of more frequent occasions being afforded for our meeting with one another, there can, I think, be only one opinion. But the occasions, in order to be taken advantage of, must be real occasions, called forth to meet the exigencies of a real want. And it seems difficult to suggest any considerable choice of subjects within the domain of applied chemistry, which could not more fittingly be brought forward at meetings of the Chemical Society, the Society of Chemical Industry, or the Society of Public Analysts, than at any specially called meetings of our own; while an addition to the number of publications in which chemical memoirs have to be sought for, cannot, at any rate, be regarded as a wholly unquestionable good. It will be, however, for the new Council, on any representation made to them, to determine whether it would be possible with advantage to set aside one or two evenings a year for the consideration of specified questions of applied chemistry having a sufficiently wide professional interest to be likely to prove attractive to any large number of our Fellows, -specially concerned, as so many of them are, in their own particular departments of chemical work.

One further matter, a strictly personal one, alone is left for me to touch upon. It devolves on me now to take my presidential leave of you. Alike under the articles of the original Institute, and under the bye-laws of our now chartered corporation, the office of President of the Institute is tenable only for a period of three years in succession. As a matter of fact, it has been my privilege to occupy that position for a period of five years; and so to have had the responsibility of delivering on five occasions a more or less lengthy—I fear, sometimes, a too lengthy—presidential address; and on this point, I would venture to remark that the duty of delivering presidential addresses does not belong to the class of duties which become easier of fulfilment by dint of frequent repetition. This my lengthened tenure of office, however, though contrary to the

spirit of our regulations, has been practically unavoidable, by reason of the transitional state through which we have lately passed; and has, I need scarcely say, been strictly in accordance with special provisions made in the Charter for tiding over the period of transition. Technically, indeed, I am still eligible for yet another two years' occupancy of the presidentship. It has been very properly felt, however, that in our present state of successfully achieved position, and quietly persisting progress, there is, in respect to the office of President, no further call for any departure from established custom. It is, indeed, a subject of gratification to the retiring Council, in calling to mind their continuous, and by no means trivial, past labours, to note the steady advance of the Institute in all the material conditions of well-doing. We have been granted our Charter, and have paid all incidental expenses: we have made and obtained allowance for our bye-laws; we have largely increased our number of Fellows and Associates; we have considerably augmented our capital; and we have halved the amount of our annual subscriptions; altogether, I think, a not unsatisfactory record to look back upon.

My tenure of office, now coming to an end, must necessarily be memorable in the annals of the Institute, by reason of its embracing the period of our incorporation by Charter; and will not, I think, be without some personal memories on the part of those, at any rate, who participated in our greatly successful festival held in celebration of that event some two years ago. For myself, I can only say that if the period of my presidency has been at times an anxious and an exacting one, it has been rendered one ever to be dwelt upon as as a subject of pleasing recollections, by the willing aid and kindly good will I have throughout experienced at all hands,—from my predecessors in the chair, from the Secretary and Treasurer, from the executive Councils with whom I have been

PRESIDENT'S ADDRESS.

associated, and from the general body of the Fellows. But the position of President of the Institute of Chemistry, however distinguished and gratifying one may feel it to be, is far from proving, or being likely to prove, a sinecure. When five years ago I most willingly, if somewhat rashly, accepted the invitation made to me to be put in nomination for the office, I confess that I somewhat under-rated the duties and responsibilities attaching thereto. I was aware of the labour and pains that had been bestowed upon the affairs of the Institute by successive Councils, and of the promising condition to which it had been brought by their efforts. I remembered the warm interest and unsparing thoughtfulness that had been expended by our first President, Dr. Frankland, not only in aiding the foundation of the Institute but in directing also the early stages of its career; nor could I be less mindful of the patient effort and ready judgment with which it was steered by my immediate predecessor, Sir Frederick Abel, through the choppy seas it had to encounter in its further progress. I knew to what a position of then present security and assured future prospects the Institute had been raised under his skilful guidance. And as it chanced that for some time before my nomination I had not served on the Council, I came to the conclusion, when thinking over the efforts and successes of my predecessors, that there was but little left for me to do; and that, following in the path their labours had marked out, I had a comparatively easy prospect before me. I fancy, however, that the responsibilities of the position will scarcely be thought to have proved less onerous in my case than in theirs, while they have certainly been of longer duration. Indulging in a fresh selfdeception with the coming on of my period of retirement, I began, I fear, to entertain a sort of jealous thought in contemplating the easy burden that was likely to fall on the shoulders of my successor. But with the yet nearer and nearer approach of my retirement, I began more and more to realise that every successive year is pretty certain to make its full share of weighty demands on the time, and thought, and kindly discretion of whomsoever may fill

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the position of President; and I congratulate the Institute that these requirements are likely to be fulfilled in so special a degree by the distinguished chemist whom I am glad to see nominated to succeed me. The desirability of having the high position of President of the Institute accorded from time to time to representatives of different branches of professional chemistry, is one that all will be ready to acknowledge; and in Dr. James Bell, we have the most prominent representative of a branch of applied analytical chemistry daily becoming of greater and greater importance. Of the high official position which he occupies, it is unnecessary for me to speak; but I may venture to remind you of the warm interest he has ever taken in the affairs of the Institute, and of the services for which we are indebted to him. Besides taking an active part in the work of the Council and its committees, and further helping us so materially on the occasion of our conference at the International Health Exhibition, he did not fail in the course of our applications at the Privy Council Office, to render us that personal aid which his recognised official position enabled him so effectually to afford. It is to me, as the retiring President, no small satisfaction to deliver up my office into such worthy and capable hands. For myself, I hope, though now relieved from the responsibility of the presidency, to be still of some service to the Institute, by taking part from time to time in the more important deliberations of the Council. And I can only regret that the circumstance of my living at a distance from London will, as it must, preclude the possibility of my affording to Dr. Bell that extent of ever ready co-operation and counsel which has been so continually extended to me by my distinguished predecessors, Dr. Frankland and Sir Frederick Abel, and I would add. by my colleague, Mr. Carteighe, the much esteemed President of the Pharmaceutical Society. To these, as indeed to all of my friends on the successive Councils, by whom, during my long period of office, it has been my good fortune to be so loyally supported, I have, in bidding them good-bye, to tender the expression of my hearty thanks.

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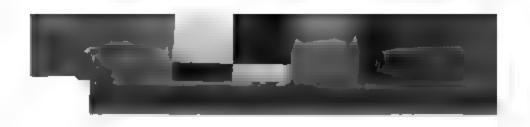
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PART II. 1888.

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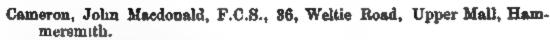
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Young, William Charles, F.C.S., 22, Windsor Road, Forest Gate, E.

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Shegog, Thomas Alexander, Royal College of Science, Dublin.

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Sutton, F. Napier, F.C.S., 57, Gordon Square, W.C.

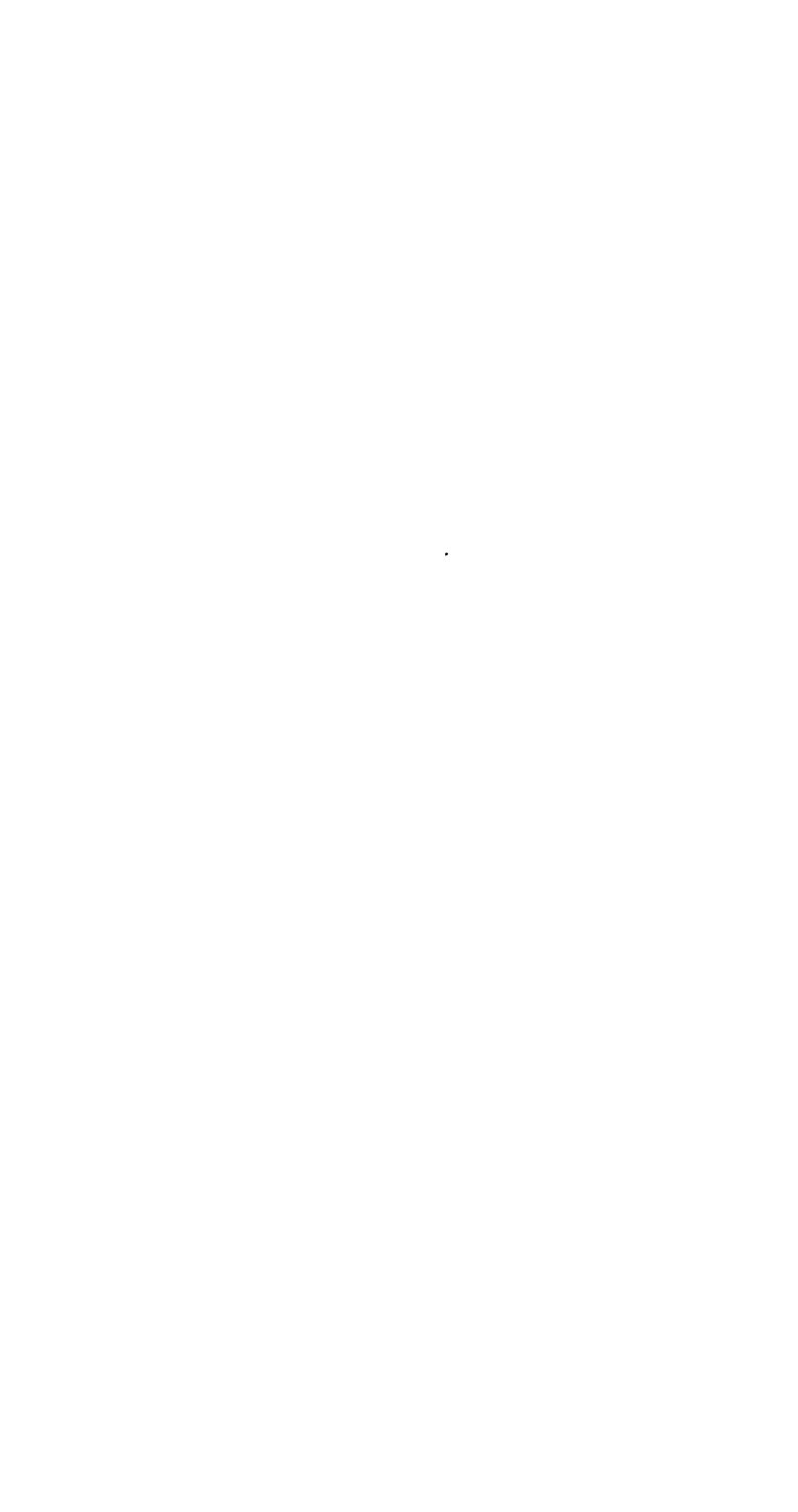
Templeton, S., 12, Rutland Square, Dublin.

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Vasey, S. A., F.C.S., Phillibrook, Leytonstone, Essex.

Walker, Frederick, Farndale. Granard Road, Wandsworth Common. White, John, The Beeches, Newton Road, Spark Hill, Birmingham. Wise, John Bailey, 190, Bellfield Street, Glasgow.









INSTITUTE OF CHEMISTRY

OF

EAT BRITAIN AND IRELAND.

PROCEEDINGS.

PART III. 1888.

Zondon:

PRINTED BY A. P. BLUNDELL, TAYLOR & Co., 177, UPPER THAMES ST., E.C.

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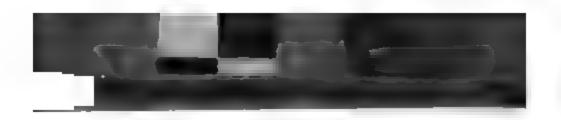
Conversazione;

Examinations;

Supplement to Register, &c.

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CONVERSAZIONE.

On Wednesday, the 13th of June, a Conversazione was given by the President, Dr. James Bell, F.R.S., at the Marlborough Rooms, Regent Street, London, and was in every way a success. The exhibits, nearly 40 in number, were of unusual beauty and interest, comprising, not only apparatus and chemical specimens, but also some recent discoveries experimentally illustrated.

Dr. Armstrong exhibited specimens illustrative of isomerism and isomeric change. Mr. G. Stillingfleet Johnson sent the peculiar form of creatinine he has obtained from human urine; and Dr. Hugo Müller quercite from the leaves of *Chamærops humilis*, and cocosite, a new substance resembling inosite contained in the leaves of several species of cocoanut palms.

Messrs. Brooke, Simpson and Spiller, had a fine collection of various dyes of the Rosanilne series, of the Eosin series, of those formed from Azo-compounds, and also dyes of the new Primuline series. In the coal tar industry, also, the Badische Anilin and Soda Fabrik, and Professor Meldola had splendid exhibits of dyes obtained from coal tar, whilst Messrs. Burt, Boulton and Haywood showed the various derivatives of the benzene, naphthalene, and anthracene series from which these colours are manufactured. Messrs. Hopkin and Williams had a noteworthy collection of fine chemicals, including beautifully crystallised platinocyanides.

The chemical apparatus was of varied kind, including numerous spectroscopes, polariscopes, and photometers, and there was a good show of microscopes; one sent by Messrs. Powell and Lealand being supplied with $\frac{1}{12}$ th apochromatic homogeneous



immersion objective, numerical aperture 1.40, and an apochromatic homogeneous immersion condenser, numerical aperture 1.40, which showed the markings on *Aphipleura pellucida* (Acus) with great distinctness.

Professor S. U. Pickering exhibited a new mixing calorimeter, and an apparatus for breaking bulbs in a calorimeter. The calorimeter consists of a platinum vessel divided into two compartments by folding doors, which are made to fit water-tight by means of two springs and caoutchonc lining. When the liquids in the two compartments are at the same temperature, the springs are released by pressing together the ebonite knobs connected with them, and the doors fly open. A stirrer, worked by an electromotor, and a thermometer is placed in each compartment.

In the apparatus for breaking bulbs, the bulb is held stationary by an inverted platinum cone attached to a rod; by hitting the upper end of this rod, the bulb is broken at the proper moment. A disc of wire gauze prevents the broken glass from being knocked against the thermometer by the stirrer, which is in the liquid.

Professor W. Ramsay and Dr. S. Young had three exhibits:—
(1.) An apparatus for showing the temperature of maximum density of water, in which a glass bulb is weighted so as to have the exact specific gravity of water at 4°; if the water is made either warmer or colder, it becomes lighter than the bulb, which consequently sinks.

- (2.) A vapour-pressure thermometer: In this the liquid is ether, containing a little alcohol in which a colouring matter has been dissolved. The vapour pressure of the ether varies with the temperature, forcing up the column. The divisions on the scale are not equal; hence the scale must be divided by comparison at certain known temperatures with an accurate mercurial thermometer.
 - (8.) The liquefaction of methyl fluoride by compression was

shown, the methyl fluoride being very nearly pure; it was prepared by heating tetramethylammonium fluoride. It liquifies at 0° under a pressure of about 15,000 millimeters, or twenty atmospheres.

Undoubtedly the most attractive spot was the table at which Mr. C. Vincent Boys exhibited his experiments with soap bubbles; the beauty of the experiments themselves, performed, as they were, with such surprising manipulative skill, exerted a kind of fascination on the visitors who thronged the table from the opening of the soirée until its close.

These experiments are arranged to shew chiefly the power of an air film to prevent two bubbles from coming into real contact. Thus, among other experiments, the outer of two bubbles was pulled out until it squeezed the inner one into a long oval, but no real contact takes place. An inner bubble filled with gas will carry up an outer one, to which are attached a wire ring and other things without the inner bubble really touching the outer one at all. A bubble will roll down a spiral groove also made of soap film, or jump one or two steps at a time down a spiral staircase made of soap film, without touching the spiral film or being injured in the least.

The experiments of Professers Ayrton and Perry with their magnifying springs were also of great interest. The principles on which this elegant method of micrometric measurement is founded, may be briefly explained as follows:—

The end of an ordinary spiral spring made of round wire, such as is used in a spring balance, does not appreciably rotate when the spring is stretched, so that when it is desired to magnify the extension it is necessary to employ a wheel and pinion or levers, or some such contrivance, which has the defect of introducing friction, back-lash, and in addition, makes it difficult for small extensions to obtain perfect proportionality between the extension of the spring and the rotation of the pointer.

By making the metal flat, however, and winding it up like a thin shaving, a spring is produced, the end of which turns through a large angle for a small azial extension of the spring, the ratio of rotation to axial extension being the greater the smaller the diameter of the spring. If the diameter of the spring be very small, for example, the $\frac{1}{400}$ th of an inch, a complete rotation of the pointer is obtained by an axial extension of the spring of less than the $\frac{1}{100}$ th of an inch.

Specimens of these magnifying springs of various sensiblities were exhibited, and they were also shown, as applied to spring balances, electro-magnetic ammeters and voltmeters for measuring direct currents and pressures, and a voltmeter based on the expansion of a short wire, for measuring alternating electric pressures. There was also a large working model showing the principle of the expanding wire voltmeter. Besides these, there was the adaption of the flattened spiral spring to a simple apparatus for measuring the co-efficient of expansion produced by rise of temperature, also to vacuum and pressure gauges and to thermometers. Lastly, there was a micrometer constructed on this principle and indicating the one twenty-thousandth of an inch.

In the room downstairs there was a model of Brin's oxygen producer shown in action by Dr. L. T. Thorne, the chemist to the company; whilst one use for the gas extracted from the atmosphere by this modern modification of an ancient process, was illustrated by Fletcher's oxygen blowpipe, which melted up thick wrought iron almost like wax.

This model of Brin's oxygen producer is designed to shew the method employed for obtaining oxygen from atmospheric air by means of barium oxide. Boussingault long ago shewed that barium oxide when heated in a current of moist air absorbs oxygen, becoming converted into barium peroxide, and that this peroxide at a higher temperature again yields up half its oxygen, leaving barium oxide ready for re-oxidation. All attempts

hitherto made to employ this method commercially for the preparation of oxygen have failed, however, owing to the fact that the barium oxide, after a few operations, gradually loses its power of absorbing oxygen. By special precautions in the preparation of the barium oxide, the drying and purification of the air used, and by improvements in the mechanical means used forsupplying the air and pumping off the oxygen, this difficulty has been overcome, and the barium oxide retains its activity almost indefinitely, so that the process can be employed for the continuous production of oxygen on the commercial scale.

Besides his powerful oxy-hydrogen blow-pipe, Mr. T. Fletcher exhibited various gas apparatus of interest to chemists, including ordinary blow-pipes, hot blast blow-pipe, gas reverberatory furnace, injector and tube furnaces, furnaces for the lecture table and muffle furnaces. Of gas burners, there were the high power burners, the drip proof burner, the new safety Bunsen, and duplex boiling burners of various forms.

Amongst the electrical apparatus were telephones; Robertson's writing telegraph, by which an actual facsimile copy of the handwriting is transmitted; Wheatstone's automatic recorder, used at the Post Office, and capable of transmitting 300 to 400 words per minute; Mr. Eric Bruce's signalling balloon; and Edison and Swan's electrical safety lamps.

Mr. Eric Stuart Bruce's electrical translucent balloon for flashing signals by night, is intended to facilitate military night signalling to long distances and in places where ordinary signalling would be impracticable, such as wooded and hilly districts; also for naval coast signalling in war, and to provide a feasible means of signalling in Arctic regions. The apparatus consists of a captive balloon made of a translucent material, several incandescent electric lamps, placed inside the balloon and supported on a specially devised holder in the form of a ladder, and lastly a metallic circuit connecting the lamps with a source of electrical

power on the ground; a special form of key is employed in the circuit, on the ground, designed to carry light or heavy currents and to make and break contact rapidly; in this key the contacts are of carbon and can be easily renewed as they wear away.

The Edison and Swan Company's safety lamp for miners consists of a storage battery of four cells enclosed in a strong teak box turned out of the solid and strengthened with metal bands; and a small incandescent lamp mounted on the side of the case, protected by a strong glass cover. The case is fitted with a hinged lid secured by a crossbar fastened with a safety nut, and having a swivel handle. The full size of the lamp is 7 inches by 4½ inches, and the weight of the whole ready for use is about 7 lbs.

Mr. James Wimshurst had his large electrical influence machine in full action, and it worked splendidly. It has 12 disks, each 2 feet 6 inches in diameter and carrying 16 metal sectors. The machine, which becomes fully excited in any condition of atmosphere with one revolution of the handle, shows large and perfect brush discharge at its terminals; with Leyden jars it will give a rapid succession of sparks 135 inches in length.

A military band, with Mr. S. Dodwell (late Coldstream Guards) as conductor, gave a selection of music during the evening.

MEETINGS OF COUNCIL.

The new Council elected on March 1st has held the usual monthly meetings with an average attendance of 19 members at each meeting. During the three months ending June 30th, there have been 15 committee meetings, at which various important matters connected with the welfare of the Institute have been discussed.

BOARD OF EXAMINERS.

The Council has arranged that in future the practical examinations shall be conducted by five examiners, acting together as a Board. The members of the Board of Examiners and the centres at which examinations will be held are as follows:—

Dr. W. W. J. NICOL Birmingham. Professor W. N. HARTLEY, F.R.S. Dublin.

Dr. E. J. MILLS, F.R.S. Glagow.

Mr. WATSON SMITH ... Manchester.

Professor J. MILLAR THOMSON..... London.

REGULATIONS FOR THE PRACTICAL EXAMINATION.

Every candidate for the Associateship will be required to pass an examination in practical chemistry. This examination will be held once a year, in June or July, as nearly as possible simultaneously at such centres as the Council may determine.

The examination will be partly qualitative, partly quantitative and will occupy about four days.

The attention of candidates is directed to the following regulations which have been adopted by the Conncil:—

1. Every Candidate shall forward to the Registrar, one calendar month at least before the commencement of the examination together with the examination fee, a note book or note books, containing a record of the chemical work of all kinds done by him during the last two years of his studentship, the genuineness of the record to be attested by himself and his professors or teachers, according to the following form, printed copies of which may be obtained on application to the Registrar.

Declaration of the Examinee, to be certified by the Professor or Teacher under whom he has worked.

- I. "I hereby declare that the whole of the work of which a record is contained in the accompanying note-book, and which includes exercises in
- † a. Qualitative inorganic analysis.
- † b. Quantitative inorganic analysis.
- † c. Qualitative organic analysis.
- † d. Quantitative organic analysis.
- † e. Gas analysis.
- $\dagger f$. Preparation of pure materials.
- $\dagger g$. Other experimental work.

Was done by me in the years 18 to 18

	Signed
II.	"I hereby certify that the work of which a record is contained in the accompanying note-book was performed by A
	B under supervision, and examined at intervals as
	indicated by signatures in the book.

- † Note.—Cross out subjects not included in the Book.
- 2. The note books will be submitted to the Board of Examiners who will take their contents into consideration, and will regulate the extent of the examination to be imposed, accordingly.
- 3. The Board of Examiners will have the power to submit any Candidate to a vivâ voce examination upon the contents of his note books, and notice shall be sent by the Registrar to any Candidate whose attendance may be required for this purpose.
- 4. The examination in quantitative analysis will include the performance of some operation selected from the candidate's own record.
- 5. The regulations relating to the production of note books will come into operation in June, 1890. In the meantime, the Board will be prepared to receive any note books that may be submitted to them and to give credit for their contents.

Syllabus of Subjects of Examination in Practical Chemistry.

QUALITATIVE.

- 1. Exercises in qualitative analysis; such as the analysis of artificial mixtures of moderate complexity, of alloys, of ores, the detection of specified substances present in minute quantities, or as impurities in commercial products.
- 2. Preparation of substances so chosen as to elicit evidence of the candidate's acquaintance with ordinary chemical operations: such as crystallisation, dissolution, distillation, &c. Determination of boiling point, melting point, relative density, or solubility of substances so prepared.
- 3. The recognition, by practical tests, of familiar typical inorganic and organic compounds.
- 4. The examination of gases, and detection of one or more of the following in a gaseous mixture: Hydrogen, oxygen, nitrogen, carbon dioxide, hydrogen chloride, hydrogen sulphide, ammonia, sulphur dioxide, nitric oxide, methane, and ethylene.

QUANTITATIVE.

- 1. The gravimetric and volumetric estimation of commonly occurring substances.
- 2. The determination of carbon and hydrogen, nitrogen, sulphur or halogens in organic compounds.
- 3. The volumetric determination of one or more of the constituents in a mixture which may contain hydrogen, oxygen, carbon monoxide, carbon dioxide, methane, ethylene, and nitrogen.

The examiner will be at liberty to put questions to candidates at any time during the examination.

Candidates will be allowed to consult books.

The fee for this Examination is Two Guineas. In the event of the candidate failing to pass, the fee will not be returned to him, but he will be admitted to one subsequent examination on payment of one guinea.

THE JULY EXAMINATIONS.

Twenty-two candidates entered for the Practical Examination held on the 16th to the 19th of July; and the following are the names of those who have been successful; these will be nominated for election at the next meeting of Council (October 26th).

LIST OF CANDIDATES WHO HAVE PASSED.

Names.	PLACE OF EXAMINATION.
J. Carter Bell	Manchester.
R. F. Blake	Glasgow.
J. F. Blomfield	London.
W. H. Bracher, B.Sc	Manchester.
H. L. Buckeridge	London.
S. H. Collins	•••••
J. K. Colwell	,
W. P. Dreaper	,
B. H. Gerrans	•••••
A. H. Green	Manchester.
H. C. Harvey	,
E. H. Jackson	•••••
H. G. Jones	London.
J. S. Liverseege	Birmingham.
S. Macadam, jun	
T. Mercer	Manchester.
J. B. Miller	
C. H. R. Moore	London.
H. B. Weeks	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,

FELLOWS AND ASSOCIATES RECENTLY ELECTED.

Since the Register went to press 87 Fellows and 17 Associates have been elected by the Council. The names and addresses of those who have since been formally admitted are as follows:—

FELLOWS.

Barbour, T. F., Chemical Department, University of Edinburgh.

Barnett, Francis T., Messrs. Hatton Sons & Co., Bilston.

Bemrose, Joseph, 56, St. Famille Street, Montreal.

Bevan, John W., Southview House, Shirehampton, near Bristol.

Bowlker, T. J., Haileybury College, Herts.

Brewis, E. Theodore, 4, Rugby Road, Ranelagh, Dublin.

- Cannon, William H., 18, Fenchurch Street, E.C.
- Cohen, Julius B., Hawkesmoor, Wilbraham Road, Fallowfield, Manchester.
- Cook, Ernest H., Newton Villa, Southville, Bristol.
- Cousins, William J., 138, Leadenhall Street, E.C.
- Trowther, Horace W., Alkali Works, Oldbury, near Birmingham.
- Dalziel, Samuel, Smyrna.
- Donald, Samuel, 145, Springburn Road, Glasgow.
- Draper, Harry N., Esterel, Temple Road, Rathmines, Dublin.
- Everson, Henry C., 16, Cross Street, Hatton Garden.
- Tray, John, Lee Place, Linwood, Renfrewshire.
- Green, John Edward, 3, John Street, Durham.
- Hailes, Alfred James, 22, Beamount Road, Hornsey Rise.
- Harbord, Frank W., Messrs. Hatton Sons & Co., Bilston.

Hargreaves, John, Widnes, Lancashire.

Hart, Peter, Messrs. Tennant & Co., 49, Faulkner Street, Manual Chester.

Hughes, Newton, The Badol, Bagill Street, Holywell, Flints.

Hughes, Thomas, Borough Analyst's Office, West Wharf, Cardin ff.

Hughes, T. Vaughan, Greenfield, Holywell, Flints.

Huskisson, Paul L., 42, Highbury Park, N.

Jackson, Edward, 27, Beaufort Road, Edgbaston, Birmingham——

Jewson, Francis A. B., 21, St. Georges Road, Southwark.

Jones, Henry Thomas, 78, Fountainhall Road, Aberdeen.

Jordon, Frank, The Wilderness Portland Cement Company, Mitcheldean, Gloucester.

Lamont, Robert, Chemical Laboratory, Sturrock Street, Kilmarnock.

Last, Frank B., Laudore R. S. O., South Wales.

Lichtenstein, Theodore D., Silvertown, E.

Mackey, William M., Monkbridge Steel and Iron Works, Leeds.

Macfarlane, Robert, The Grange Metal Works, Jarrow-on-Tyr_

McNeill, Bradford, 25a, Old Broad Street, E.C.

Manners, Charles Junr., 10, Moss Street, Paisley.

Moore, Charles Clifton, 125, Chester Road, Hartford, Cheshi re.

Moul, Frank, Aldersgate Chemical Works, Southall.

Newton, William, 18, Fenchurch Street, S.E.

Ody, Joshua Caleb, 8, Stanhope Terrace, Galleyhill, Swansco mbe, near Greenhithe, Kent.

Ostersetzer, Julius, Eden Quay, Dublin.

Payne, John H., 17, Croft Terrace, Jarrow-on-Tyne.

Perkins, Frank P., The Close, Exeter.

Pollard, Frederick, Labaratoire Khedivine, Administration Sanitaire, Cairo, Egypt.

Reid, Walter F., Fieldside, Addlestone. Rumble, Charles. 63, St. John's Hill Grove, S.W. Russell, William, Midland Institute, Birmingham.

Sayers, Joseph Johnstone, Sandfield Cottage, Stevenston, Ayrshire. Shaw, Frederick W., Heapey, near Chorley. Smith, Frederick, Army Veterinary School, Aldershot. Staples, Henry John, Spondon, Derby. Stevenson, John, Broxburn, N.B.

Taylor, John, 3, Paragon Place, Cheltenham.

ASSOCIATES.

Bredin, James Crawford, 18, Faberstrasse Leipsig, Germany.

Draper, Carter N., Esterel, Temple Road, Bathmines, Dublin.

Hill, Thomas G., Oakwood, Acocks Green, Birmingham.

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This list is given in duplicate on page 19, so that it can be detached and inserted in the Register (Proceedings, Part II., 1888) as a supplement.

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The Subscription List was closed on the 1st August.

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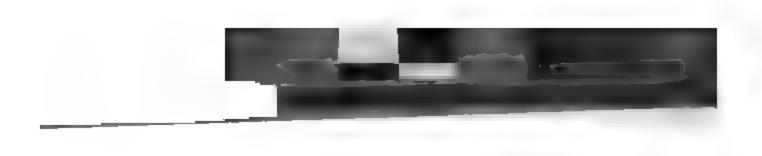
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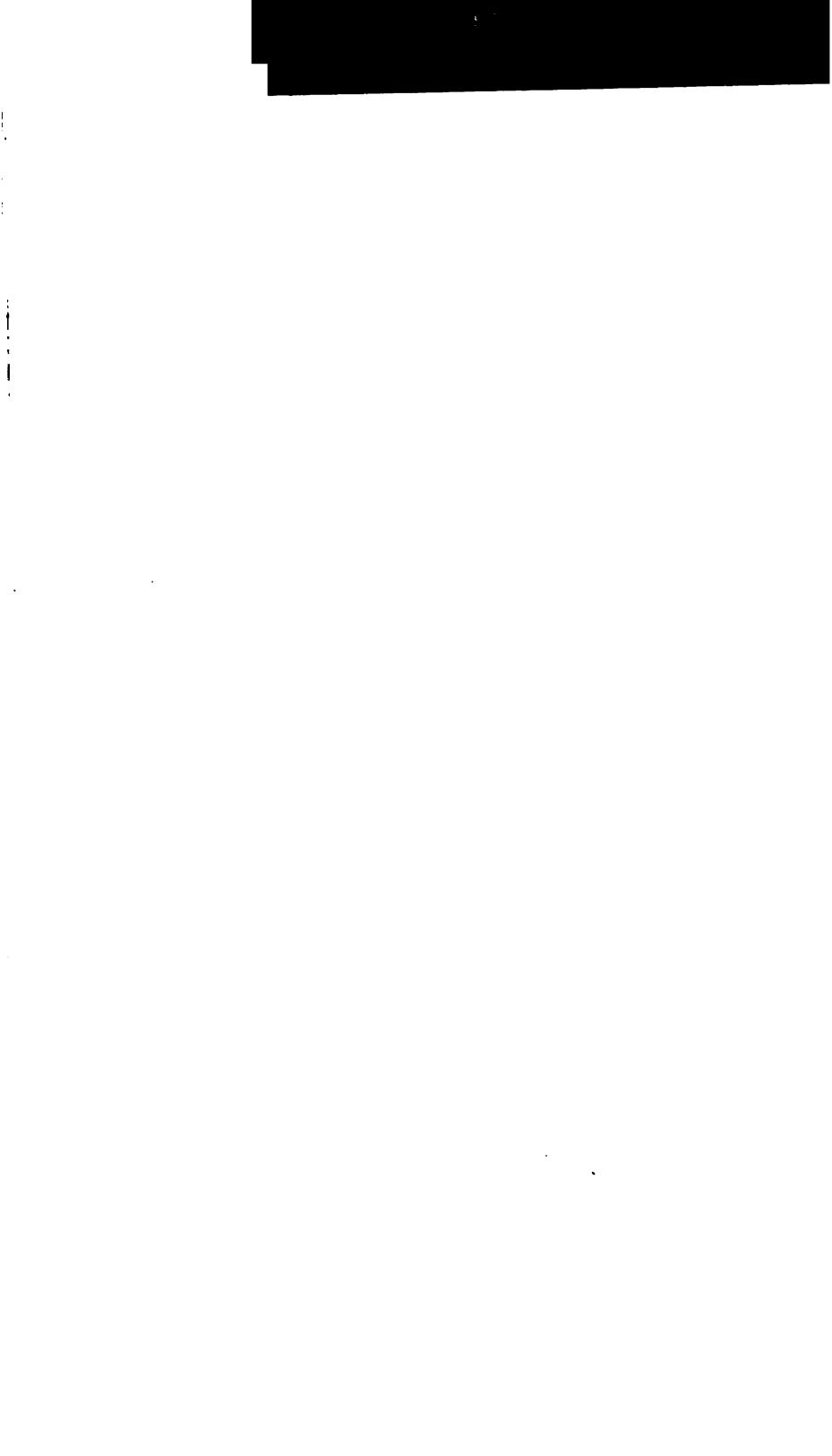
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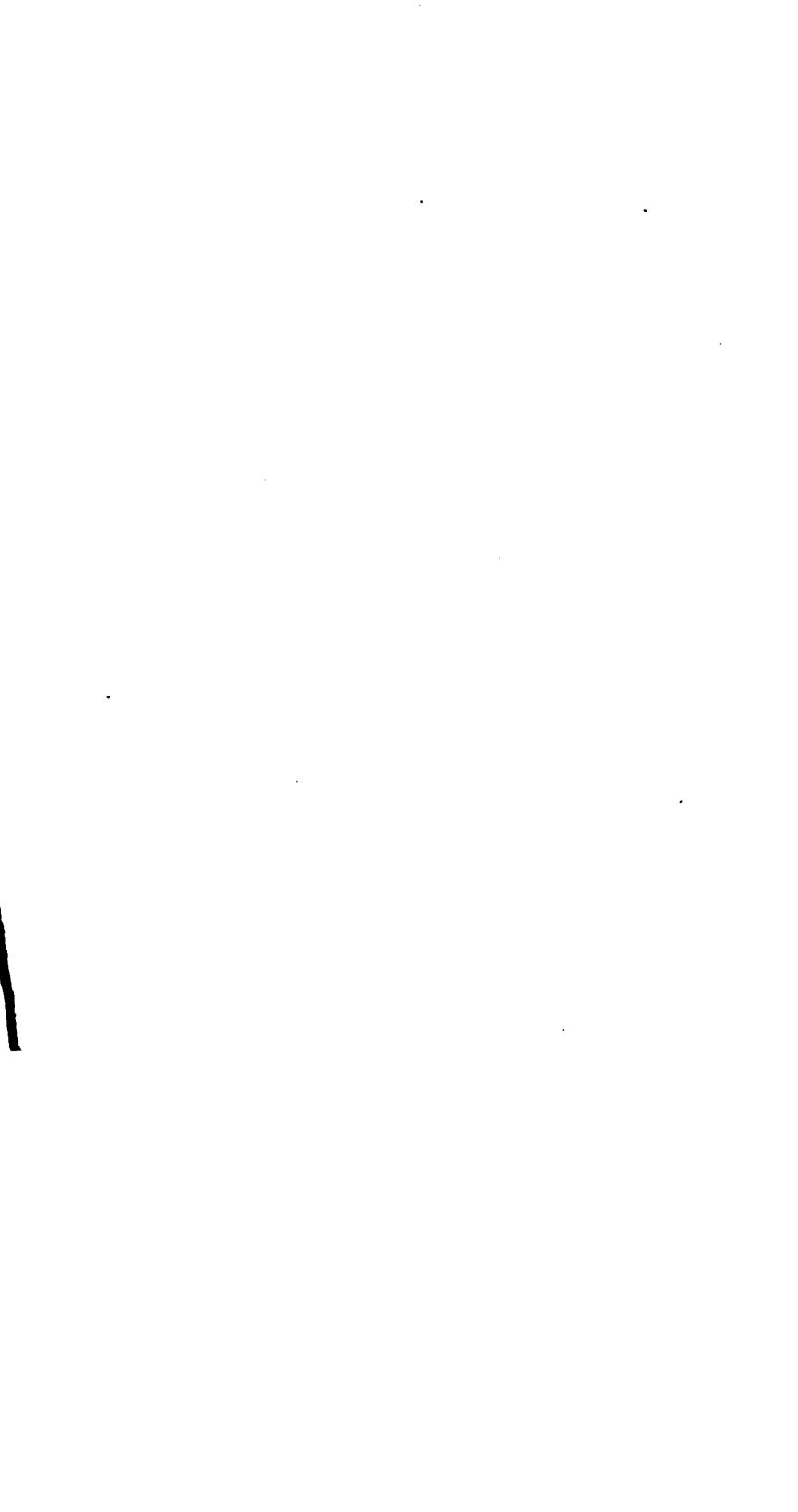
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INSTITUTE OF CHEMISTRY

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REAT BRITAIN AND IRELAND.

PROCEEDINGS.

PART II. 1889.

Annual General Meeting.

President's Address.

Zondon :

A. P. BLUNDELL, TAYLOR & Co., 177, UPPER THAMES STREET, E.C.

1889.



PROCEEDINGS

OF THE

INSTITUTE OF CHEMISTRY

0F

GREAT BRITAIN AND IRELAND

9, ADELPHI TERRACE, W.C.

CHARLES E. GROVES, Secretary,

PART II. 1889.

REPORT OF THE ANNUAL GENERAL MEETING

BALANCE SHEET FOR 1888,

ANI

ADDRESS OF THE PRESIDENT

Dr. JAMES BELL, F.R.S., &c.

ISSUED BY AUTHORITY OF THE COUNCIL.

April 2nd, 1889.



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LIST OF OFFICERS AND COUNCIL

Elected MARCH 1st, 1889.

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REGISTRAR AND SECRETARY.

C. E. GROVES, F.B.S., &c.



REPORT

OF

ANNUAL GENERAL MEETING.

THE THIRD ANNUAL GENERAL MEETING of the Institute of Chemistry of Great Britain and Ireland incorporated by Royal Charter, was held at Burlington House, on Friday, the 1st March, 1889.

The Balance Sheet (see p. 40) having been laid before the Meeting by the Treasurer, it was received and adopted.

The President then delivered his Address (see p. 41.)

The Report of the Council was read by the Secretary as follows:—

At the Annual General Meeting held last year there were 544
Fellows and 45 Associates on the Register. Since then, 162
Fellows and 48 Associates have been admitted, whilst 2
Fellows have resigned. The names of 12 Fellows and 3
Associates have been removed from the Register for nonpayment of subscriptions, and we have to lament the decease
of seven of our Fellows—Professor J. S. Brazier, Mr. J. J.
Coleman, Mr. W. F. Donkin, Mr. Holdsworth Fisher, Dr
Peter Griess, Mr. James Taylor, and Dr. W. Wallace. The

names on the Register, therefore, are now 685 Fellows, and 83 Associates; a total increase of 179 Members during the past year.

Twenty-two Candidates were admitted to the Practical Examination held by the Examining Board at London, Dublin, Glasgow, and Manchester, and the 19 of these who passed were subsequently elected as Associates of the Institute.

In conducting these examinations, the Examiners no longer act and report individually, but are constituted a Board of Examiners, consisting of five Examiners who act collectively; the duties of the Board being to carry out the Regulations made from time to time by the Council relating to the Examination of Candidates for admission to the Associateship.

A new Prospectus of Qualifications required of Candidates for admission to the Institute of Chemistry as Associates has also been issued, containing the evidence of qualifications required of the Candidate before his admission to the Examination in Practical Chemistry, the regulations for this Examination, and a syllabus of the subjects of Examination in Practical Chemistry both qualitative and quantitative.

The Council also has to congratulate the Members on the present satisfactory financial position of the Institute; £500 Consolidated 2½ per Cent. Government Stock has been purchased this year, so that at the present time there is the sum of £5,000 Consols standing in the name of the Institute.

The Institute is indebted to the President and Council of the Chemical Society for the use of their rooms during the past year.

- The Report of the Council having been received and adopted, the Officers and Council for the ensuing year were elected (see p. 35,) Messrs. F. J. Montague Page and J. E. Saul acting as Scrutineers.
- The CENSORS elected were Mr. David Howard, Dr. W. Odling, Dr. W. J. Russell, and Dr. T. Stevenson.
- Mr. H. J. Helm, Dr. F. L. Teed, and Mr. W. Thorp were appointed Auditors.

F CHEMISTRY OF GREAT BRITAIN AND IRELAND. INSTITUTE 0

INCORPORATED BY ROYAL CHARTER.

STATEMENT OF ACCOUNT AND BALANCE SHEET,

FROM 1ST JANUARY TO 31ST DECEMBER, 1888.

		- બર	s. d.	અ		d.		3	•	7
Balance in hand, 1st January, 1st	y, 1st						Printing, Stationery, and Postage	170	0	_
January, 1888	:			302 14	14	1 0	Advertisements	5 6	8	2
Entrance Fees	:	183 15	0				Rent, Office, and Miscellaneous Expenses	87		_
Life Compositions	:	96 12	0				Corporation Duty	9	15	O
4				280	2	0	Examiners' Fees	16	•	9
656 Fellows' Subscriptions	:	707	8				Salaries and Wages	165	0	0
81 Associates	:		-			-	Parliamentary, Agents	က	က	J
				786	ဘ	•	Purchase of £500 23 °/2 Consols	488	15	9
Interest on Consols	•			17.5	2	- #	Balance in London and Westminster Bank,			
Examination Fees	:			46	-#	C	31st December, 1888	551	5 51 15	G
	; ;		બ	£1,591	-	00		£1,591	1	S
				I)		<u></u>				1
Assets.	ets.						Finbilities.			
December 31st, 1888, Cash at Bank	ank	:	:	£551 15	15	6,	December 31st, 1888		None.	ľ
£5,000 23 °. Consols.	ώ4 ⊙ . ⊙	Consols	•		l	1				1

CHARLES E. CASSAL. H. J. HELM. BERNARD DYER.

Audited and found correct,

Jan. 15th, 1889.

THE PRESIDENT'S ADDRESS.

In accordance with the usual custom, it is now my privilege to make a few observations on the position and prospects of our Association.

You have heard the Financial Statement of our Treasurer, and all, I think, will agree that it is highly satisfactory and encouraging. With regard to our accumulated property, when it became known that it was the intention of the Government to redeem, if necessary, and convert all Government Three per Cent. Stock into Two and Three-quarters per Cent., the Council considered it advisable to accept the terms offered by the Chancellor of the Exchequer in the matter of Consols, and resolved to convert the £4,500 Consols belonging to the Institute into the New Consolidated Stock of Two and Threequarters per Cent. This has been done, and the new Stock duly inscribed in the Bank books in the names of our Trustees. Since then we have been able, owing to the comparatively large sum we have received during the past year for entrance fees and life compositions, to invest a further sum of £500, thus making up our accumulated capital to £5,000.

We have on the year an increase of 38 Associates and 141 Fellows; and our income, including £280 7s. received for Entrance Fees and Life Compositions, notwithstanding the small amount of our annual contribution, has exceeded our expenditure by £737 16s. 10d.

At our First Annual General Meeting, held in the year 1878, the number of Fellows on the Register was 225, whereas to-day, it will be seen by the report of the Council, we have an aggregate of 768 members, consisting of 685 Fellows and 83 Associates. This is a remarkable result to have achieved within a period of about eleven years, especially when it is borne in mind, that a strict investigation of the qualifications of candidates for admission has, been exercised and maintained throughout from the foundation of the Institute.

The Fellows are aware, that after we obtained our Charter, the Council decided to adopt a generous course towards our professional brethren who had not previously joined the Institute, and to give all those who had a distinct claim to be included within our ranks an opportunity of becoming Members of our Association within a certain fixed period, upon fair and reasonable conditions, and without the exaction of a fine. In response to the invitation, which was published in several scientific journals, the Council received a very large number of applications for admission from professional chemists in different parts of the Kingdom, and also from a few gentlemen in the Colonies. The claims of each applicant for admission were most patiently and carefully considered by the Nominations' Committee, and a large proportion of the candidates were recommended for election, either as Fellows or Associates, according to their position and standing. In some cases, where the evidence of qualification was somewhat doubtful, and the age of the candidate did not render it discourteous to call upon him to undergo an examination, the Committee recommended that he should be admitted to an examination in practical chemistry. The privilege conceded by the Council of direct admission to the Fellowship ceased on the 1st of March last, and thenceforth admission to our Fellowship will only be granted to those who have received the requisite course of general scientific training, have passed the-

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examination for the Associateship, and have held the grade of Associate for the prescribed period of three years.

The large number of applications which were received from professional chemists and others for admission to our Fellowship, is an i'lustration of the high estimation in which the Institute is already held; but it should be borne in mind that it has not attained to its present satisfactory position without the expenditure of a large amount of valuable time and labour by the Members of your successive Councils, and I feel sure you will agree that it is only right that we should record our appreciation of the services which they have individually and collectively rendered to the Institute. While, however, fully recognising the services rendered by the Council in furtherance of the interests of the Institute, we must not overlook how largely we are indebted for its prosperity and promising condition to the special efforts and loyalty of my three distinguished predecessors. It would be difficult to say to which of these three eminent chemists, we are under the greatest obligation for the great labour and pains that they have respectively bestowed upon the affairs of the Institute. As one who took part in our first Incorporation under the Com-Panies' Act of 1867, and who has been associated more or less with The Council from the beginning, I am able to speak with some athority as regards the services which they have rendered, and I n affirm that on every occasion on which the furtherance of the terests of the Institute was involved, all three were found in the refront, ready to advocate its claims and to support their arguents by their personal influence.

In addition to their united services, each has established for imself a special claim for our gratitude. With the original ovement for bringing about our organisation, Dr. Frankland's ame will always be associated, as practically having been the

leader, pioneer, and founder of the Institute; while to Sir Frederick Abel the utmost credit will always be accorded for having skilfully and successfully steered the Institute over a most difficult and uncertain period of its history, when a certain measure of apathy and dissatisfaction threatened to cause serious defection among its members. As regards the special services rendered by my predecessor, Dr. Odling, it is needless to say that his name will ever be justly associated with the attainment of our incorporation by Royal Charter in lieu of Articles of Association. It will readily be admitted that the task, which he undertook in obtaining our Charter, was one surrounded with no little difficulty, and it was only by the earnestness with which he laboured, and his unceasing efforts, that eventually the much-coveted prize was gained for us.

It will thus be seen, that when last year you elected me to the office of President, the Institute was established on a satisfactory basis under a Royal Charter, and its success was fully assured by the efforts of my three predecessors and your successive Councils; but from my lengthened experience in the management of its affairs, I was aware that difficult questions, at least for some time, would be likely to occasionally arise for solution by the Council; and, indeed, at the time of our last anniversary meeting, a question of this description and of vital importance to the objects and interests of the Institute, was pressing for settlement. In dealing with matters of this kind, especially when there are certain class-interests involved, and strong views are entertained on the one side and on the other, it is necessary to seek for a solution of the matter by arriving at a fair and reasonable compromise, and this is generally practicable by a patient and exhaustive discussion of the subject, conducted in a spirit of loyalty to the Institute, and with an earnest desire to arrive at a satisfactory conclusion. As a result of the discussions and deliberations of the Nominations Committee, conducted on the basis indicated, I am happy to be

able to announce that they arrived at a unanimous decision, which was subsequently endorsed and accepted by the Council. I allude, as you will doubtless anticipate, to the subject of the general scientific training of candidates necessary for the purpose of qualifying for admission to the practical examination for the Associateship.

In the Prospectus, which has now become superseded by the adoption of a new one, the general course of scientific training of candidates for admission as Associates to the Institute was laid down as follows:—"That he (the candidate) has passed satisfactorily through a course of three years' study in any one or more of the Universities or chartered or incorporated colleges or schools, previously approved by the Council, in the subjects of Theoretical and Analytical Chemistry, Physics, and Elementary Mathematics." To this prescribed course of training there is an alternative in the new Prospectus, and in future it will be sufficient if the candidate can produce evidence "that he has been engaged for four years in the Practice of Chemistry in the laboratory of a Fellow of the Institute, during at least two years of which time, he has been entered as a Student of the Institute, and has regularly attended systematic courses of instruction in the said subjects at such university, college, or school."

The alternative course of training provided in this new Prospectus will, it is believed, be fully adequate to maintain the requisite standard of qualifications, and the practice in the Inboratory of a Fellow of the Institute may reasonably be expected to exercise an important and beneficial influence upon the progress of the student during his two years' systematic training at one of the recognised colleges or schools.

The Council have also had under consideration the important subject of the practical examinations held in connection with

the Institute, and they have made some fundamental changes in the system previously followed. Formerly each Examiner acted individually, and examined the Caudidates on the general lines of the syllabus approved by the Council, and at the completion of the examination, he reported to the Examination Committee, giving full details as to the results arrived at by the Candidates, with an opinion as to the manner in which each had executed his work. The Committee then, after carefully considering the reports of the different Examiners, decided whether the several Candidates had done their work satisfactorily, and were entitled to be recommended for election. Under this system, the exercises given were practically left to the independent judgment of the Examiner, as he was merely limited by the general terms of the syllabus, and in the absence of mutual consultation and co-operation between the Examiners, it was found that there was a want of uniformity in the test applied, and consequently that the method of conducting the practical examination was not satisfactory.

After long and careful consideration, it was decided that the Examiners should cease to act independently, and that, in future, the Examinations should be conducted by a Board of five Examiners under fresh regulations prepared by the Council, and subject to modifications from time to time as occasion might require. The Board of Examiners thus constituted have to set the exercises for the Candidates, and the Examiner at each centre is required to furnish the Board with a detailed account of the work performed by each Candidate. The July Examinations, last year, were carried out under the control and supervision of the new Board, and, from the experience gained, there is no doubt that with some slight modification of the present regulations, the system will work satisfactorily.

An important feature in the new regulations is an arrangement by which the practical Examination is supplemented by certified during his studentship. This has to be attested, both by himself and his professor or teacher, and a careful scrutiny of the records of his work by the Board of Examiners will enable them to form a general idea of the efficiency, or otherwise, of the course of training through which the Candidate has passed.

Altogether, it may be confidently felt that the examinational and other requirements of Candidates for admission to the Associateship, as now formulated by the Council, will serve to establish and maintain a satisfactory standard of scientific and practical proficiency, and, at the same time, fulfil one of the primary objects of the Institute, by successfully promoting the elevation of "the profession of consulting and analytical chemistry." The affairs of the Institute are now so hopeful and promising, that it only remains for the Fellows to turn it to good account, and to raise it to such a position of power and influence as to enforce a general recognition of the importance and value of holding the license of the only incorporated body in the Kingdom, representative of professional chemists.

The accomplishment of this is probably, not so remote as might be supposed, for the Institute, as at present constitued, is a union of great scientific strength. It practically includes every chemist of repute or recognised standing in the Kingdom, whether professional or professorial, and with the maintenance of such a combination, the continued prosperity of the Institute is not only assured, but its moral influence must rapidly gain great ascendancy among the profession. The professorial element has, from the begining, been an important factor in our success, and it is to be hoped that as in the past, so in the future, professors and teachers of chemistry, to whom we are already so largely indebted, will continue to work cordially with us, and earnestly assist in the furtherance of the cause of scientific education.

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PRESIDENT'S ADDRESS.

There is still much room for devising and adopting means [or promoting the interests of the Institute, and for increasing its usefulness. It is generally admitted that considerable advantages would result to the Institute if more frequent opportunities were afforded to the members for meeting each other to discuss various topics, and to exchange their views on different subjects of interest to professional chemists. It scarcely seems enough, in the case of a qualifying Institute which cannot enforce membership before the profession of chemistry can be legally practised, to rest solely on its power of conferring a degree to win the confidence and attachment of its members. I believe it would tend greatly to enhance the feeling of good-fellowship and give a stimulus to scientific work, if an outlet were provided for what appears to be a strong latent desire, which might be found to be very general, to bring before the whole body of Fellows, in some public manner, questions of high scientific interest or public utility. It might be that in this way, the Institute would attain a degree of visibility in a short time which it would otherwise take years to accomplish. I would not suggest that frequent meetings should be held; but that a yearly gathering of the members should be convened, lasting two or more days, according to the necessity of the case, when papers would be read and discussed, and appropriate reports of the same published in the form of " Proceedings."

Speaking with all respect for other associations of a kindred character, it can scarcely be denied that no other society could bring to bear upon questions of applied chemical science so much knowledge and experience as the collective Fellowship of the Institute of Chemistry. It seems to me, therefore, a pity that with materials so abundant and a platform so broad that facilities should not be afforded for that interchange of views and comparison of results which would tend ultimately to the mutual benefit of the Fellows.

It seems unwise to close the mouth of the Institute as a consultative body, and we are not without encouragement in the experience of the results of the Conferences held a few years ago, to induce the Fellows to favourably entertain the suggestion thrown out. What I would propose is, that a set and convenient time for holding a meeting every year should be approved, to which the Fellows would be able to look forward, and at the same time prepare for rendering useful service by bringing matters of special interest and of importance before the meeting, and taking part in the discussions.

It has been suggested by a prominent member of the Council Lat it might be desirable to found a Widows' Fund in conmection with the Institute, and it would certainly be a most reseful thing to undertake if we could see our way to successfully so, but our income, owing to the smallness of the annual contribution, is so limited, that I am afraid we should not have sufficient money to draw upon to enable us to found such a and on a satisfactory basis. The proposition, however, is one well deserving serious consideration, as the establishment of any reseful fund—either a Widows' or a Benevolent Fund—in connecion with the Institute, would tend to exercise a beneficial influence upon our future position, by drawing the Fellows more closely together and establishing a community of interest. Fellows, I think, will agree that it would be desirable to pursue the matter farther, and to appoint a Committee to carefully investigate the subject, to see if any scheme of the kind indicated would be practicable.

During the past year the Council have issued three parts of Proceedings" of the Institute. The Register, which forms a separate part of the "Proceedings," was not printed last year until the month of May, but this year it will be issued much earlier, as it was sent to press on the 31st January. It might

have been printed even earlier than the date named, but it was thought desirable to hold it back in order that the names of some, recently elected, whose claims for admission had been under considerable period, might be included.

If the suggestion which I have ventured to make with regard to the holding of an Annual Convention of the Fellows of the Institute be adopted, the reports of our "Proceedings" will be greatly increased.

Until recently, considerable latitude has been allowed to members who were behind in the payment of their subscriptions, and no action was taken until they were considerably in arrear, to put in force the bye-law which renders any member liable to be excluded or suspended from membership, in the event of his annual subscription being in arrear for one year. The Council had the subject under their consideration in the month of November last, when they came to the conclusion that it was to the interests of the Institute to adopt a more stringent course with regard to the payment of the annual subscriptions, and a resolution was passed as follows:—"That, if the members whose subscriptions are in arrear do not pay them before the first day of January, 1889, their names be removed from the Register, in accordance with Bye-law 72; and that the Secretary be instructed to send them notice to that effect."

This resolution will form a precedent for the adoption of a similar course each year; and, seeing that the annual subscription is now so small, there does not appear to be any feasible excuse for any member being a defaulter.

In concluding these few observations, I desire to refer to the pleasure which it gave me in the month of June last to arrange for a Conversazione in connection with the Institute, and to express my gratitude to the members of Council and Fellows, who so

cordially assisted me in my labour of love. I have great faith in the effects which usually accrue from occasional personal intercourse between the Fellows, and it was a great satisfaction to me to find so much interest taken by the members of the Institute generally in our evening social gathering.

OBITUARIES.

It will be seen from the Report of Council that the Institute has lost seven Fellows during the past year. The names of the deceased Fellows are—J. J. Coleman, W. F. Donkin, J. H. Fisher, P. Griess, J. Taylor, W. Wallace, and J. S. Brazier.

JOSEPH JAMES COLEMAN, F.R.S.E., F.C.S., who died on 18th December last, was born in 1838, in Lincolnshire. His youth was passed with a pharmaceutical chemist in Halifax, where he attended the Mechanics' Institute, and soon gave evidence of scientific attainments of a high order, for in 1860 he contributed a paper to the proceedings of the British Association on important relations between the atomic weights and the atomic volumes of the elements. For several years after this he was science teacher in Chester Training College, but the discovery of rich bituminous material in Wales turned his attention to mineral oil manufacture, in which his success was so great that he was offered the post of research chemist in Young's paraffin works. Here he made marked improvements in lubricants; and, in dealing with the uncondensed gases from the shale retorts, invented an apparatus for the production of the necessary low temperatures and great pressure by mechanical means. This led Mr. J. Bell, the well-known shipowner and importer of fresh meat, to request him to devise some trustworthy method of refrigeration for the meat chambers in the holds of steamers. A satisfactory solution of the problem was soon forthcoming, and ten years ago the first Bell-Coleman mechanical dry-air refrigerator was fitted up in one of the Anchor

Line steamships. About 1884, Mr. Coleman retired from businessand settled down at Bearsden, near Glasgow, whence from time to time he contributed valuable papers to the various societies.

WILLIAM WALLACE, Ph.D., F.R.S.E., F.C.S., began his professional career as assistant in Anderson's University at Glasgow. He was next appointed lecturer in the College of Science and Arts, in the same town, and in 1874 the office of Public Analyst for the City of Glasgow was conferred upon him. He was joint author of papers on the Prevention and Control of Infectious Diseases, and on Sewage Disposal, and has further written well-known works on the Analysis of the Gas-yielding Coals of Scotland. Dr. Wallace was for many years an active member of the Philosophical Society of Glasgow, of which he was at one time President, an office which he filled with conspicuous ability. His skill and invariable courtesy gained for him the esteem of a wide circle of friends. His death occurred on 5th November last.

James S. Brazier, F.C.S., Emeritus Professor of Chemistry in Aberdeen University, who died on 14th January 1889, was a native of Rye, in Sussex. Entering the Laboratory of the Royal College of Chemistry, he soon, by his remarkable experimental skill, attracted the notice of Prof. Hofmann. From this laboratory he went to assist Dr. Andrews, at Queen's College, Belfast, and in 1852, he became assistant to Dr. Clark, at Marischal College. In 1862 he was appointed to the chair of Chemistry in the Aberdeen University, where his practical chemistry classes quickly became famous. Apart from his duties as a teacher, Professor Brazier did other important work for the University. For many years he acted as Secretary to the Medical Faculty and for examinations for the Degree; and he succeeded to the office of Dean on the retirement of Dr. Ogston.

PETER GRIESS, Ph.D., F.R.S., F.C.S., was born in 1829, in Hesse Cassel, and studied under Kolbe, at Marburg University.

PRESIDENT'S ADDRESS.

About 1856 he came to London, and became one of Dr. Hofmann's Private assistants at the Royal College of Chemistry, where he commenced those investigations which in after times led to his great discoveries in the azo- and diazo-compounds. His first research appeared in "Liebig's Annalen" in 1858, and in 1859 the discovery of the first diazo-compound was made known. Since that time, his published papers have been very numerous, as the Proceedings of the various societies devoted to chemistry testify. It may be noted that he was the originator of the metaphenylenediamine test, for the detection of nitrates in water, a method which has since been perfected by Preusse and Messrs. Allsopp, in 1859, offered him the post of scientific adviser to their firm, which position he filled till his death, although in the meantime he had more than one call to professorial chairs in German Universities. His strikingly sudden death occurred in August last during a holiday trip to Bournemouth.

WILLIAM FREDERICK DONKIN, M.A., F.C.S., was born at Oxford, ¹⁰ 1845. He was educated at Eton, and in 1864, having obtained a Scholarship, was elected a Demy of Magdalen College, Oxford. He specially devoted himself to the study of chemistry, and became in 1875 lecturer in Natural Science in Keble College, and in 1877 tutor of the same College. In 1879-80 he served as one of the Examiners in the Final Honours School of Natural Science. For some time he was assistant to the late Sir B. C. Brodie, and he also held the position of County Analyst for Oxfordshire. Coming to London in 1880, he was appointed Lecturer on Chemistry at St. George's Hospital. Professor Donkin was Honorary Secretary to the Photographic Society, and one of the most distinguished members of the Alpine Club; indeed, it was during a mountaineering expedition in the Caucasus in August last that the sad accident occurred which cost him his life. photographs of Alpine scenery, which mark a distinct advance in the art, are full of artistic excellence.

JAMES TAYLOR, F.C.S., was a native of Scotland. He spent some time in a lawyer's office, but preferring chemistry to law he went to Glasgow University, where he was for some time assistant in the chemical laboratory. Next he became chemist to a London chemical works, and was among the first to suggest and carry out the revivification of the oxide of iron used in purifying gas. After this he devoted himself chiefly to the study of practical Agricultural Chemistry, and with the view of carrying out certain ideas on the value of fish as a manure, he went to New York and was engaged largely in the manufacture of the new preparation. Returning to England, he accepted an appointment in a large copper smelting works. From this he went back to America and spent some years there in erecting plant for copper works and in acting as general manager. His health becoming bad he gave up active duties, and passed the remainder of his life in travel. He died in London last spring, after a short but severe illness.

PROFESSOR J. HOLDSWORTH FISHER, B.A., and Physical Science Exhibitioner of Christ Church, Oxford; Ellerton Scholar, Durham; and Open Scholar of St. Mary's Hospital, London, was appointed to the Bengal Educational Department in 1882. He occupied the position of Professor of Chemistry in Patna College in 1883, and in Hooghly College, Lower Bengal in 1884. He died in 1886.

FELLOWS RECENTLY ADMITTED.

Since the Register went to Press, two Fellows and one Associate have been admitted to the Institute.

FELLOWS.

Mackenzie, George S., c/o Malcolm Bros., Capes Chambers. Bond Street, Sydney, N.S.W.

Quayle, Edwin, Texteth Road, Glebe Point, Sydney.

ASSOCIATE.

Moore, C. H. R., 17, Great Tower Street. E.C.

A. P. Blundell, Taylor & Co.
PRINTERS, &c.
177, Upper Thames Street,
London, E.C.





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INSTITUTE OF CHEMISTRY

OF

REAT BRITAIN AND IRELAND.

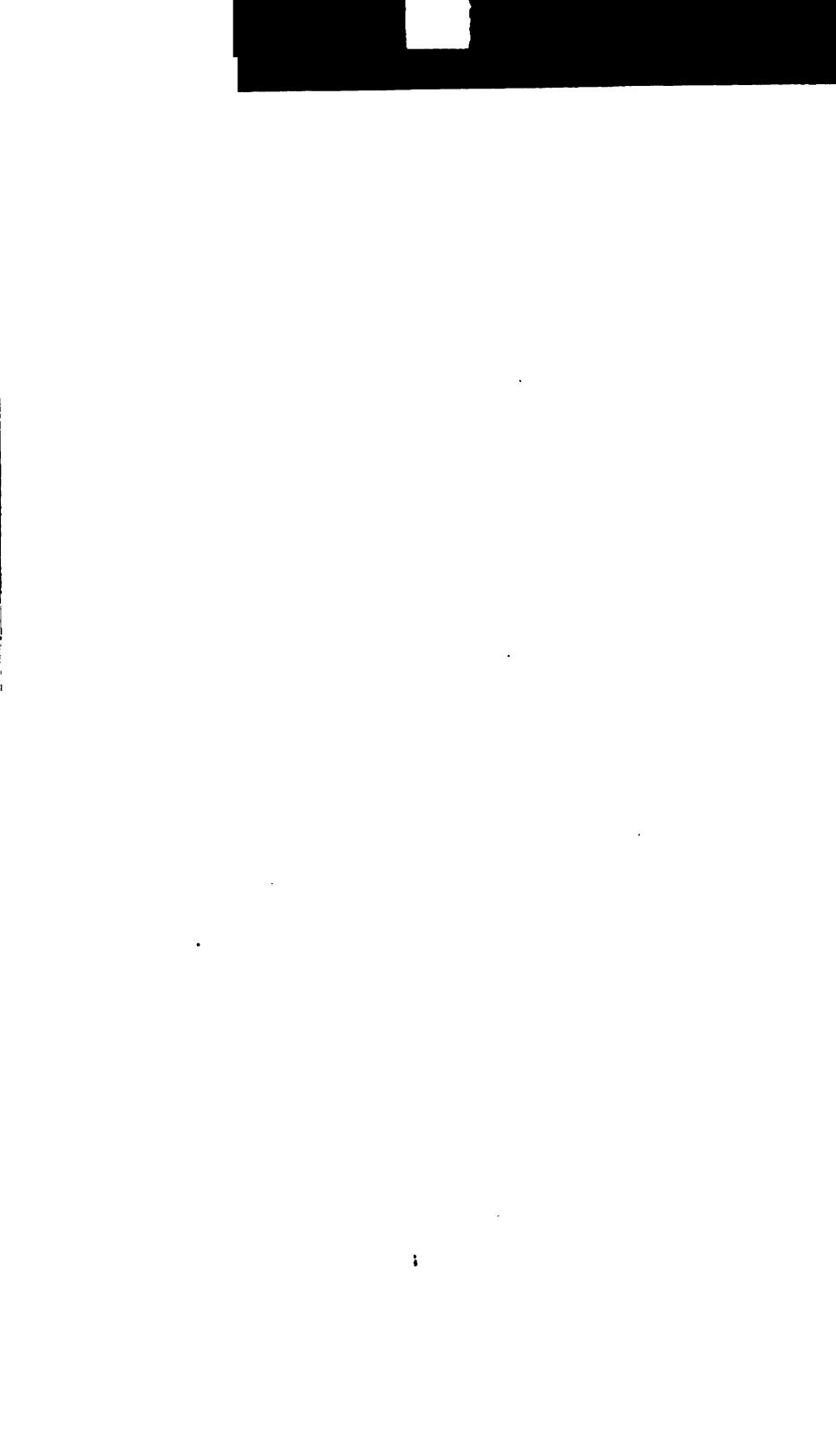
PROCEEDINGS.

PART III. 1889.

Zondon :

PRINTED BY A. P. BLUNDELL, TAYLOR & Co., 177, UPPER THAMES ST., E.C.

1889.



PROCEEDINGS

OF THE

INSTITUTE OF CHEMISTRY

OF

GREAT BRITAIN AND IRELAND.

PART III. 1889.

Prospectus;

Regulations for the Admission of Students;

Examinations;

Supplement to Register, &c.

London:

A. P. Blundell, Taylor & Co., 177, Upper Thames Street, E.C.

1889.



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MEETINGS OF COUNCIL.

THE COUNCIL elected on the First of March has held the usual meetings with an average attendance of 18 at each meeting. There have been 15 Council Meetings held, at which, besides routine business, important matters affecting the welfare of the Institute have been fully discussed.

The Council, after the most careful consideration of the question, has determined what are the qualifications which in future will be required of candidates who apply for admission to the Practical Examination of the Institute, and have embodied these requirements in the revised "Prospectus." They have also drawn up "Regulations for the Admission of Students" in accordance with Chap. VII. of the Bye-laws. The text of the Prospectus and Regulations are appended, copies of which may be obtained on application to the Secretary.



PROSPECTUS

OF QUALIFICATIONS BEQUIRED OF CANDIDATES FOR ADVISSION TO

THE INSTITUTE OF CHEMISTRY

AS

ASSOCIATES.

Every Candidate for the Associateship will be required to produce evidence—

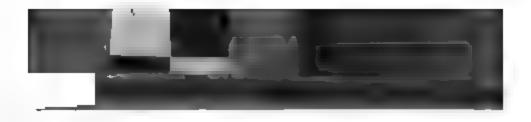
- (1) That he is not less than twenty-one years of age.
- (2) That he has passed satisfactorily through a systematic course of at least three years' study in the subjects of Theoretical and Practical Chemistry, Physics, and Elementary Mathematics, in any one or more of the Universities or chartered or incorporated Colleges or Schools approved by the Council; or that he has been engaged for four years in the practice of Chemistry in the Laboratory of a Fellow of the Institute, during at leat two years of which time he has been entered as a Student of the Institute and has regularly attended systematic courses of instruction in the said subjects at such University, College, or School.
- (3) That he has passed the prescribed examinations in the aforesaid subjects at such University, College, or School.*

^{*} When a Candidate for the Associateship, although complying with Regulations 1 and 2, cannot produce evidence satisfactory to the Council, of having passed examinations in Chemistry, I'hysics, and Mathematics, he shall be required to pass an Examination, such Examination to be by printed or written questions, to which the Candidate shall return written answers, without access to Books, MSS., or Memoranda.

- If a Candidate has passed any Examination such as the following, no further evidence of training in General and Theoretical Chemistry, Physics, and Elementary Mathematics, will be required:—
- The final Honours Examination for the degree of B.A. at the University of Oxford in the subject of Chemistry, in the School of Natural Science. The Examination for the degree of B.A. at the University of Cambridge in the subject of Chemistry, and in part II. of the Natural Science Tripos.
- The final or Degree Examination for B.Sc., in the Universities of Edinburgh, Durham, or London, or the Victoria University, in the subjects of Chemistry and Physics.
- The Senior Moderatorship in Experimental Science in the University of Dublin.
- The Associateship in the Royal School of Mines, if taken before 1884.
- The Associateship of the Normal School of Science in the division of Chemistry.
- The Associateship of the Royal College of Science, Dublin, in the faculty of Manufactures.

PRACTICAL EXAMINATION.

Every Candidate for the Associateship will be required to pass an examination in Practical Chemistry. This Examination will be held once a year, in June or July, as nearly as possible simultaneously at such centres as the Council may determine.



The Examination will be partly qualitative, partly quantitative and will occupy about four days.

The attention of Candidates is directed to the following regutions, which have been adopted by the Council:—

1. Every Candidate shall forward to the Registrar, one calendar month at least before the commencement of the Examination, together with the examination fee, a note-book or note-books containing a record of the chemical work of all kinds done by him during the last two years of his studentship, the genuineness of the record to be attested by himself and his professors or teachers, according to the following form, printed copies of which may be obtained on application to the Registrar.

Declaration of the Examinee, to be certified by the Professor or Tracher under whom he has worked ;—

_	of the work, of which a record is con- e-book, and which includes exercises in
† a. Qualitative morganic analysis. † b. Quantitative inorganic analysis. † c. Qualitative organic analysis. † d. Quantitative organic analysis.	† c. Gas analysis. † f. Preparation of pure materials. † g. Other experimental work.
was done by me in the years 18	to 18
Sig	ned

II. "I hereby certify that the work of which a record is contained in the accompanying note-book was performed by A B under supervision, and was examined at intervals as indicated by signatures in the book.

Signed.

† Note.—Cross out subjects not included in the above.

- 2. The note-books will be submitted to the Board of Examiners, who will take their contents into consideration, and will regulate the extent of the examination to be imposed accordingly.
- 3. The Board of Examiners will have power to submit any Candidate to a viva voce examination upon the contents of his note-books, and notice shall be sent by the Registrar to any Candidate whose attendance may be required for this purpose.
- 4. The examination in quantitative analysis will include the performance of some operation selected from the Candidate's own record.
- 5. The regulations relating to the production of note-books will come into operation in June, 1890. In the meantime, the Board will be prepared to receive any note-books that may be submitted to them, and to give credit for their contents.

Syllabus of Subjects of Examination in Practical Chemistry,

QUALITATIVE.

- 1. Exercises in qualitative analysis: such as the analysis of artificial mixtures of moderate complexity, of alloys, of ores, the detection of specified substances present in minute quantities, or as impurities in commercial products.
- 2. Preparation of substances so chosen as to elicit evidence of the Candidate's acquaintance with ordinary chemical operations: such as crystallisation, dissolution, distillation, etc. Determination of boiling point, melting point, relative density, or solubility of substances so prepared.

- 3. The recognition, by practical tests, of familiar typical inorganic and organic compounds.
- 4. The examination of gases, and detection of one or more othe following in a gaseous mixture: Hydrogen, oxygen, nitrogen carbon monoxide, carbon dioxide, hydrogen chloride, hydroger sulphide, ammonia, sulphur dioxide, nitric oxide, methane, antethylene.

QUANTITATIVE.

- 1. The gravimetric and volumetric estimation of commonly occurring substances.
- 2. The determination of carbon and hydrogen, nitrogen, sulphur or halogens in organic compounds.
- 3. The volumetric determination of one or more of the constituents in a mixture which may contain hydrogen, oxygen, carbon monoxide, carbon dioxide, methane, ethylene, and nitrogen.

The Examiner will be at liberty to put questions to Candidates at any time during the examination.

Candidates will be allowed to consult books.

The Fee for this Examination is Two Guineas. In the event of the Candidate failing to pass, the Fee will not be returned to him, but he will be admitted to one subsequent Examination on payment of One Guinea.

UNIVERSITIES AND COLLEGES

APPROVED BY

THE COUNCIL OF THE INSTITUTE.

Aberdeen	
Aberyst wyth Bengor	The University.
Rangor	University College.
Bengor Wth Beliast	University College.
Belfast Birmings	Queen's College.
	The Mason College.
Bristol Cambrid	University College.
Cardiff Cardiff	The University.
Cardin Ge Cork	University College.
Cork Dublin	Queen's College.
********	Royal College of Science for Ireland.
nand.	Trinity College.
Dundee Edinbra	University College.
2 Wich	The University.
Glasgow	The University.
39	Anderson's College.
Teeq8	The Yorkshire College.
Liverpool	University College.
London	City and Guilds Institute, Central Institution.
11	" Finsbury Technical College.
"	King's College.
"	Normal School of Science.
11	University College.
Manchester	The Owens College.
Newcastle-on-Tyne	The Durham College of Science.
Nottingham	University College.
Oxford	The University.
Sheffield	Firth College.
St. Andrew's	The Universities.

The above are Institutions at which all the subjects required of Candidates for admission as Associates of the Institute are taught. The Council, however, will accept evidence of a sufficient training in any one or more of the required subjects at any College or Institution, provided always the courses of instruction fulfil the conditions imposed by the Council as to training. Particulars of these conditions may be obtained on application to the Secretary.



REGULATIONS FOR THE ADMISSION OF STUDENTS.

- 1.—Applicants for Admission to the Studentship of the Institute shall be at least 17 years of age, and shall, at the time of application, be pupils of a Fellow of the Institute, or at one of the Universities or chartered or incorporated Colleges or Schools, approved by the Council.
- 2.—Every Candidate for admission as a Student must, when sending in his application, state in writing the names of the Schools or Colleges at which he has received his general education.
- 3.—Students may be admitted by the Council on the recommendation of a Fellow of the Institute with whom they are engaged in the study of Chemistry, or of a Professor of Chemistry in any of the Universities or chartered or incorporated Colleges or Schools, approved by the Council, at which the applicant for admission is studying.
- 4.—No applicant shall be deemed to be admitted to the Institute until he has paid his first Annual Registration Fee.
- 5.—No Student shall remain a Student of the Institute for a period exceeding four years from the date of his admission, but at the expiration of that period he shall, unless the Council decide otherwise, cease to be a Student, and his name shall be removed from the Register.
- 6.—Any Student who shall omit to pay his Annual Registration Fee, when due, shall, on a Resolution to that effect being passed by the Council, bave his name removed from the Register.
- (N.B.—The Annual Registration Fee is payable in advance, becoming due on the first day of January in each year.)

- 7.—Students are entitled to attend all Ordinary Meetings of the Institute, but may not vote at such Meetings. Students shall receive, gratis, the "Proceedings" of the Institute as they are published.
- 8.—The Annual Registration Fee is Two Shillings and Sixpence.

EXAMINATION IN PRACTICAL CHEMISTRY.

The Examination in Practical Chemistry, which was held on July 15th and following days, was conducted by the Board of Examiners, namely:—

Examinations were held at four of the centres, namely Birmingham, Glasgow, Manchester, and London, and it is satisfactory to find that although the regulations relating to the Production of note books do not come into operation until next year, many of the candidates sent in note books, accompanied by the Professor's certificate that the work contained in it had been Performed under his supervision, or that of his assistants.

The number of Candidates who entered was 28, but of these only 26 presented themselves for Examination, namely, 14 at Manchester, 9 at London, 2 at Birmingham and 1 at Glasgow. Of these, 20 passed the Examination in a satisfactory manner, and the following list contains their names, and that of the centres at which they were Examined.

Mr.	P. Babington	Manches	ter.
"	W. R. BARRACLOUGH	London.	
"	C. R. Beck	Birmingham.	
,,	W. Duncan	Manchester.	
"	W. FRENCH	London.	
"	C. GIBBINS	Londou.	
,,	F. A. GLENDINING	Manchester.	
,,	J. GRANT	,,	"
"	F. H. Jennison	,,	71
"	P. KAY	,,	,,
3 7	W. McCubbin	;9	,,
>7	W. R. Oddy	,,	"
"	H. RAMAGE	,,	79
••	A. A. READ	"	,,
"	С. Е. Sohn	London.	
**	J. F. Tocher	Birming	ham.
"	G. W. A. TEANBY	Manches	ster.
"	W. L. WILLIAMS	London.	,
,,	G. R. WINDER	Manchester.	
79	R. W. WOOSNAM	London.	

The Examinations were exactly alike at all the centres, and the exercises set, the same. Those in qualitative analysis comprised a mixture containing sodium, barium, zinc, and calcium, and silicic carbonic, and phosphoric acids. The candidates also had to recognise by practical tests two substances given—namely, nitrate of urea and quinine. In addition, they had to prepare sodic ferric oxalate. The salt had to be made from ferrous sulphate and oxalic acid, with of course the usual laboratory re-agents: 50 grams of oxalic acid was given to each Student for this purpose and he had to obtain from it as large a yield as possible of the salt in a well crystalized condition; and then to determine its solubility at 20° C.

In quantitative analysis the following exercises were set:-

- 1.—(a) An alloy of tin and lead containing 24.70 per cent. of tin and 75.22 per cent. of lead; (b) a sample of bone ash.
- 2.—The organic substance for combustion was acetanilide, in which the candidates had first to test to see whether it contained nitrogen, and then to determine the carbon and hydrogen.
- 3.—Determination of nitrogen in a solution of sodium nitrate by the nitrometer.

Judging from the work generally, the candidates appear to have learned their quantitative analysis better than their qualitative.

FELLOWS AND ASSOCIATES.

Since the Register went to press five Fellows and eighteen Associates have been elected by the Council, and two Students have been admitted.

The names and addresses of those who have been formally admitted are as follows:—

FELLOWS.

Crampton, George, 4, Victoria Street, Westminster, S.W.

Evans, P., Norman, Nash Mills, Hemel Hempstead.

For, William, 85, Gracechurch Street, E C.

Galbraith, David R., 5, Bell Rock, Remiera, Auckland, New Zealand.

Hellon, Robert, 47, New Lowther Street, Whitehaven.

Mackenzie, George S., c/o Malcolm Bros., Capes' Chambers, Bond Street, Sydney.

Quayle, Edwin, Texteth Road, Glebe Point, Sydney.

Sharpley, W. P., Broughton Copper Works, Salford, Manchester.

Van, Geyzell John L., Indian Medical College, Madras.

ASSOCIATES.

Babington, Percival, c/o Mrs. Percy Hirst, Elmfield, Rotherham. Yorkshire.

Barraclough, W. H., Pembroke House, Atherton Road, Forest Gate, E.

Blake, R. F., 37, Hartington Street, Dublin Road, Belfast.

French, William, University Chemical Laboratory, Cambridge.

Gibbins, Cecil, Holly Lawn, Beechen Cliff, Bath.

Grant, James, Owens College, Manchester.

McCubbin, W., Mill Bank House, West Derby, Liverpool.

Moore, C. H. R., 17, Great Tower Street, E.C.

Oddy, Robert W., 60, Waterhouse, Toad Lane, Rochdale.

Ramage, Hugh, 10, Bridle Road, Crewe.

Read, A. A., Ventnor House, Houston, Devon.

Sohn, Chas. E., 25, Beverley Road, Anerley, S.E.

Teanby, Geo. W. A., 22, Grosvenor Place, Leeds.

Tocher, James F., 1, Chapel Street, Peterhead.

Winder, G. R., The Villas, Bramhall, Stockport.

STUDENTS.

Ivatts, Harold, 21, Phibsboro Road, Dublin.

This list is given in duplicate on p. 19, so that it can be detached and inserted in the "Register" (Proceedings, Part I, 1889) as a supplement.



SUPPLEMENT TO REGISTER-1889.

FELLOWS.

Crompton, George, 4, Victoria Street, Westminster, S.W.

Evans, P. Norman, Nash Mills, Hemel Hempstead.

Fox, William, 85, Gracechurch Street, E.C.

Galbraith, David R., 5, Bell Rock, Remiera, Auckland, New Zealand.

Hellon, Robert, 47, Lowstin Street, Whitehaven.

Mackenzie, George S., c/o Malcolm Bros., Capes' Chambers, Bond Street, Sydney.

Quayle, Edwin, Texteth Road, Glebe Point, Sydney.

Sharpley, W. P., Broughton Copper Works, Salford, Manchester.

Van, Geyzel John L., Indian Medical College, Madras.

ASSOCIATES.

Babington, Percival, c/o Mrs. Percy Hirst, Elmfield, Rotherham, Yorkshire.

Barraclough, W. H., Pembroke House, Atherton Road, Forest Gate, E.

Blake, R. F., 37, Hartington Street, Dublin Road, Belfast.

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Grant, James, Owens College, Manchester.

McCubbin, W., Mill Bank House, West Derby, Liverpool.

Moore, C. H. R., 17, Great Tower Street, E.C.

Oddy, Robert W., 60, Waterhouse, Toad Lane, Rochdale.

Ramage, Hugh, 10, Bridle Road, Crewe.

Read, A. A. Ventnor House, Houston, Devon.

Sohn, Chas, E., 25, Beverley Road, Anerley, S.E.

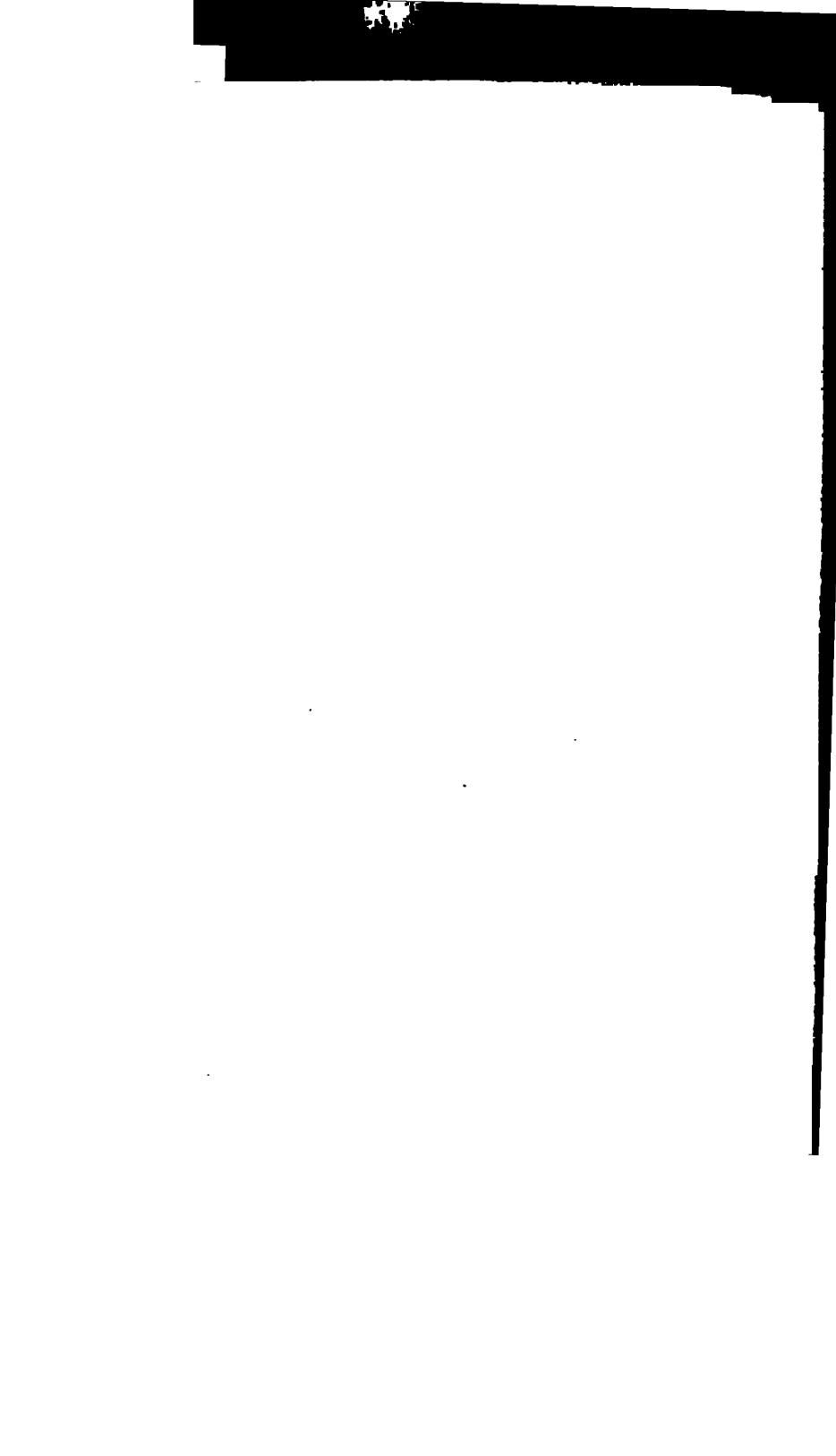
Teanby, George W. A., 22, Grosvenor Place, Leeds.

Tocher, James F., 1, Chapel Street, Peterhead.

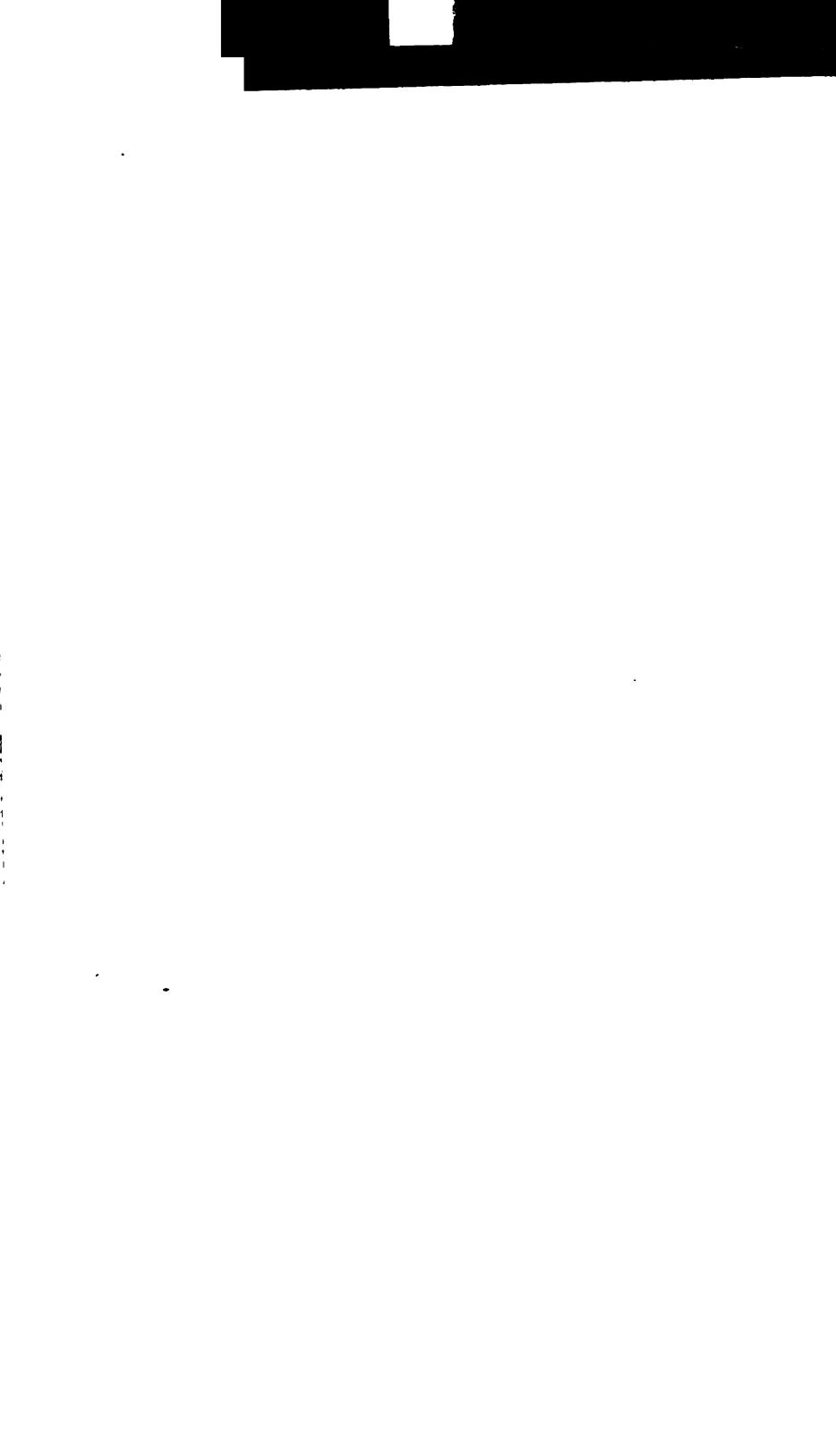
Winder, G. R., The Villas, Bramhall, Stockport.

STUDENTS.

Ivatts, Harold, 21, Phibsboro Road, Dublin.







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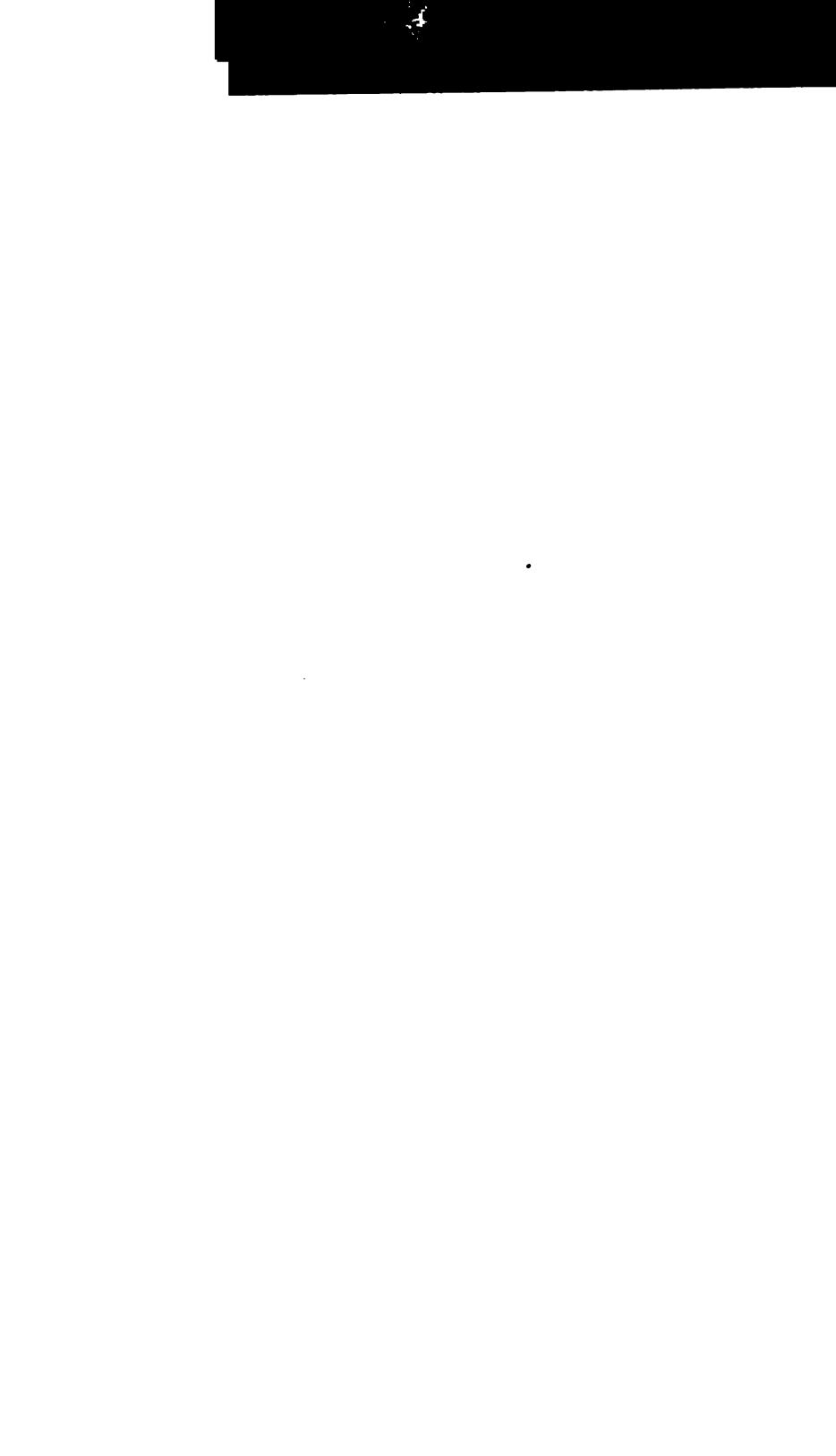
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CHARLES E. GROVES,

Registrar and Secretary,

9, Adelphi Terrace, W.C.

1st January, 1890.



Fellows and Associates are requested to send
• 1 • 4 • • • • • • • • • • • • • • • •
immediate notification of change of address to
the Secretary.
the Secretary.



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NAMES OF FELLOWS.

Fellows who have paid Life Compositions are marked *

Abel, Sir Frederick A., C.B., D.C.L., D.Sc., F.R.S., V-P.C.S., 40, Cadogan Place, S.W.

Abney, Capt. W. W., F.R.S., F.C.S., Welleslie House, Wetherby Place, S.W.

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Ackroyd, William, M.Ph.S., Borough Laboratory, Crossley Street, Halifax.

Acworth, Joseph J., F.C.S., Sheldmont, Shootup Hill, Brondesbury, N.W.

Adams, Matthew Algernon, F.C.S., Maidstone.

Adeney, Walter Ernest, F.C.S., Royal University, Dublin.

Adrian, Huskisson, Rev., M.A., Reading School, Berkshire.

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Crowder, William, Anglo Continental Guano Works, Tidal Basin, Victoria Docks, E.

• Crowther, Horace Woodward, F.C.S., Beeches Road, West Bromwich.

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Dalziel, Samuel, Smyrna.

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Darling, William Howarth, F.C.S., 126, Oxford Street, Manchester.

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Davidson, Robert, Fiji Sugar Company, Navria River, Fiji Islands.

Davies, Edward, F.C.S., Royal Institution, Liverpool.

Davies, Robert Higgins, F.C.S., Apothecaries' Hall, Blackfriars, E.C.

Davis, George E., F.C.S., South Cliff House, Higher Broughton, Manchester.

Davis, Henry Wilson, Crescent Road, Kingston Hill, S.W.

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Dechan, Martin, F.C.S., Chemical Laboratory, Hawick, Scotland.

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Dent, William Y., F.C.S., Belle Vue House, Wood Street, Woolwich, S.E.

Dewar, Professor James, F.R.S., F.C.S., Cambridge.

Dibdin, William J., F.C.S., Mayfield, Grange Road, Sutton, Surrey.

Dickinson, Arthur John, F.C.S., Neptune Tar Works, Surrey Canal, Deptford, S.E.

Dittmar, Professor William, LL.D. (Edin.), F.R.S., F.R.S.E., Glasgow and West of Scotland Technical College, Glasgow.

* Divers, Professor E., M.D., F.R.S., F.C.S., Hongo, Tokyô, Japan.

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Duggan, Thomas Richard, F.C.S., Burrell's Wharf, Millwall, E.

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Evans P. Norman, Ph.D., F.C.S., Nash Mills, Hemel Hempstead.

Everson, Henry Collins, 16, Cross Street, Hatton Garden, E.C.

Fairfax, Alfred, 20, St. Dunstan Street, Gipsy Lane, Forest Gate, Essex.

PROCEEDINGS

OF THE

INSTITUTE OF CHEMISTRY

0**F**

GREAT BRITAIN AND IRELAND.

PART I. 1890.

REGISTER FOR 1890.

sued by Authority of the Council,

CHARLES E. GROVES,

Registrar and Secretary,

9, Adelphi Terrace, W.C.

'st January, 1890.



.

Fellows and Associates are requested to send immediate notification of change of address to the Secretary.

Hooper, Egbert Grant, F.C.S., The Laboratory, Somerset House, W.C.

Hopkins, Frederick Gowland, Lilburn Lodge, Enfield.

Hornby, John, 73, Shenley Road, Camberwell, S.E.

Hoskins, Arthur Percy, F.C.S., 19, Ashness Road, New Wandsworth, S.W.

* Howard, David, F.C.S., Rectory Manor, Walthamstow, E., and Stratford, E.

Howard, Thomas, F.C.S., 50, Ellington Street, Liverpool Road, N.

* Howard, William Dillworth, Stratford, E.

Hughes, John, F.C.S., 79, Mark Lane, E.C.

Hughes, Newton, The Bedol, Bagillt, Holywell, Flintshire.

Hughes, Thomas, F.C.S., Borough Analyst's Office, West Wharf, Cardiff.

Hughes, T. Vaughan, F.C.S., Greenfield, Holywell, Flintshire.

Hummel, Professor John James, F.C.S., The Yorkshire College, Leeds.

Hunt, Bertram, Victoria Chambers, South Parade, Leeds.

Huntington, Professor Alfred Kirby, Assoc.R.S.M., F.C.S., Metallurgical Laboratory, King's College, W.C.

Huskisson, Henry Owen, F.C.S., 42, Highbury Park, N.

Huskisson, Paul L., 42, Highbury Park, N.

Huson, Charles William, B.Sc. (Lond.), 5, York Buildings, Dale Street, Liverpool.

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Jackson, Herbert, F.C.S., King's College, W.C.

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Jamieson, Thomas, F.C.S., 173, Union Street, Aberdeen.

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Jarmain George, F.C.S., 9, York Place, Huddersfield.



Bischof, Professor Gustav, F.C.S., 4, Hart Street, Bloomsbury, W.C.

Boram, W. P., B.Sc., F.C.S., Boyal Naval College, Greenwich, S.E.

Bunt, Thomas Porter, M.A., F.C.S., Wyll Cop, Shrewsbury.

Byth, Alexander Wynter, F.C.S., M.R.C.S., Court House, St. Marylebone Road.

Bodner, Richard, F.C.S., 11, Dartmouth Park Avenue, N.W.

Belas, Thomas, F.C.S., Chiswick, London, W.

Bethanley, Charles Herbert, F.C.S., The Yorkshire College, Leeds.

Bottomley, James, D.Sc., B.A., F.C.S., Homer Terrace, Lower Broughton, Manchester.

Bowdler, Arthur Clegg, F.C.S., 20, Bank Terrace, Blackburn.

Bowlker, Thomas James, Haileybury College, Herts.

Bowman, Frederick Hungerford, D.Sc., F.R.S.E., F.C.S., West Mount, Halifax, Yorkshire.

Bowey, James John, F.C.S., Kingston, Jamaica.

Budy, H. Bowman, F.R.S., F.C.S., 5, Robert Street, Adelphi, W.C.

Braithwaite, Arthur, 10, Hartington Road, Stockton-on-Tees.

Branson, Frederick Woodward, F.C.S., 14, Commercial Street, Leeds.

Brewis, E. Theodore, 6, Dolphin Terrace, S.C.R., Dublin.

Briggs, Thomas Lynton, F.C.S., 7, Platt Street, New York, U.S.A.

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Brock, John, F.C.S., British Alkali Works, Widnes, Lancashire.

Brothers, Horace Edward, F.C.S., Golden Hill, Stoke-on-Trent.

Brough, Bennett Hooper, Assoc. R.S.M., F.C S., F.G.S., 5, Bobert Street, Adelphi, W.C.

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Brown, David, F.C.S., 93, Abbey Hill, Edinburgh.

Brown, Henry, F.C.S., Cannon Brewery, Watford, Herts.

Brown, Horace T., F.R.S., F.C.S., Burton-on-Trent.

 Brown, Professor James Campbell, D.Sc., F.C.S., University College, Liverpool.

Buch, Carl Von, B.A., F.C.S., 1, St. James's Street, S.W.

Buchan, Alexander, 13, Willow Bank Crescent, Glasgow.

Buchanan, John Young, F.B.S., F.C.S., 10, Moray Place, Edinburgh.

Buckmaster, Charles Alexander, F.C.S., 16, Heathfield Road, Mill Hill Park, Acton, W.

Lapper, Edwin, M.D., F.C.S., Ledwich School of Medicine, Peter Street, Dublin.

Lapraik, William, F.C.S., Chemical Laboratory, St. Bartholomew's Hospital, E.C.

Last, Frank B., F.C.S., Landore, R.S.O., South Wales.

Lawes, Sir John Rennet, F.R.S., F.C.S., Rothamstead, St. Albans.

Lawrance, Henry Awbrey, F.C.S., 28, Grosvenor Road, Gunnersbury, W.

Laws, Joseph Parry, F.C.S., 3, Fyfield Road, Oxford.

Lawson, Professor George, LL.D., Ph.D., Dalhousie College and University, Halifax, Nova Scotia, Canada.

* Lawson, Thomas Atkinson, Ph.D., B Sc., F.C.S., 15, Alexandra Road, N.W.

Leach, J. Comyns, M.D., B.Sc., The Lindens, Sturminster Newton, Dorset. Leebody, Professor J. Robinson, M.A., D.Sc., Magee College, Londonderry.

Legg, John Edmund, M.A., (Cantab.,) F.C.S., The College, Weymouth.

Lewes, Professor Vivan B., F.C.S., Royal Naval College, Greenwich, S E.

Lewis, Arthur Edward, F.C.S., 3, Upper Fitzwilliam Street, Dublin.

Lewkowitsch, Isidore, Ph.D., F.C.S., Whitehall Soap Works, Leeds.

Lewin, George, Laboratory, Somerset House, W.C.

Lichtenstein, Theodore D., F.C.S., Silvertown, London, E.

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Wertheimer, Julius, B.Sc., B.A., F.C.S., Leeds School of Science, Leeds.

Westmoreland, James W., Assoc.R.S.M., 25, Park Square, Leeds.

Weston, William, Assoc.R.S.M., F.C.S., H.M. Dockyard, Portsmouth.

Whewell, George, F.C.S., Town Hall Chambers, 15, Exchange Street, Blackburn.

* Whiffen, William George, Lombard Road, Battersea, S.W.

Whitely, Richard Lloyd, F.C.S., University College, Nottingham.

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Williams, P. Caradoc, Bonnington Sugar Refinery, Leith, near Edinburgh.

Williams, Rowland, F.C.S., 28, Pall Mall, Manchester.

Williams, William John, F.C.S., 623, Market Street, Camden, U.S.A.

Williamson, Robert, F.C.S., Cleveland Chemical Works, Middlesbrough.

Wilson, Andrew, Analytical Chemist, Stirling.

Wilson, Charles J., F.C.S., 19, Little Queen Street, Westminster, S.W.

Wilson, George Ferguson, F.R.S., F.C.S., Heather Bank, Weybridge.

Wilson, James Henry, F.C.S., 6, Fenchurch Buildings, E.C.

Wilson, Professor William Herbert, Ph.D., F.C.S., Presidency College, Madras.

Wingham, Arthur, F.C.S., 34, Oxford Mansions, W.C.

Winser, Percy James, F.C.S., The Grove, Lower Bebington, Cheshire.

Wolf, Alfred, Ph.D., The Alizarine Works, Middlesbrough.

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Worrall, Jason Hall, F.C.S., 158, Ellesmere Road, Sheffield.

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Wright, Richard Henry, 6, Hillside, Womersley Road, Hornsey, N.

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* Young, Sydney, Professor, D.Sc., F.C.S., University College, Bristol. Young, William Charles, F.C.S., 22, Windsor Road, Forest Gate, E.

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Akitt, Thomas, F.C.S., Begum Serai, Tirhoot State Railway, India.

Babington, Percival, c/o Mrs. Percy Hirst, Elmfield, Rotherham, Yorkshire. Barraclough, W. H., F.C.S., Pembroke House, Atherton Road, Forest

Beck, Charles Ridgeway, High Street, Burton-on-Trent.

Gate, E.

Bell, Percy Carter, F.C.S., The Cliff, Higher Broughton, Manchester.

Blake, R. F., 37, Hartington Street, Dublin Road, Belfast.

Blomfield, James T., 18, Richmond Terrace, Clapham Road, S.W.

Blount, Bertram, Chemical Laboratory and Testing Works, Broadway, Westminster, S.W.

Blozam, Arthur George, F.C.S., Royal Agricultural College, Circucester.

Bredin, James C., 18, Faberstrasse, Leipsic, Germany.

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Chaney, Harry James, 29, Chalcot Crescent, Regent's Park, N.W.

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Colwell, James R., Court House, St. Marylebone, W.

Connah, James, B.Sc. (Lond.), The Laboratory, Somerset House, W.C.

Cooksey, Thomas, B.Sc., F.C.S., 21, Brownswood Park, N.

Douglas, William, F.C.S., Usine Diamond, Demerara.

Draper, Carter N., Esterel, Temple Read, Rathmines, Dublin.

Dreaper, W. P., Messrs. Grant & Co., Ponder's End.

Eastes, Ernest John, 67, Romilly Road, Finsbury Park, N.

Ellwood, Thomas Ashcroft, F.C.S., 46, St. Mary's Terrace, Paddington, W.

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Firth, A., Whitwood Chemical Co., Normanton.

French, William, University Chemical Laboratory, Cambridge.

Garrett, Frederick Charles, F.C.S., 4, Kempson Road, Walham Greec.

Gerrans, Benjamin H. Jun., F.C.S., 47, Aubert Road, Highbury, N.; and 12, Finsbury Street, E.C.

Gibbins, Cecil, Holly Lawn, Beechen Cliff, Bath.

Gill, Edward J. G., F.C.S., Trivannamulur, South Aarcot, Madras Presidency, India.

Grant, James, Owens College, Manchester.

Gray, George Watson, 12, Argyle Road, Garston, near Liverpool.

Green, Alfred H., Oaklands, Lowton, Newton-le-Willows.

Harvey, Henry Cummins, Raglan House, Brooklands, Manchester.

Head, Casimer J., F.C.S., Elisenhutte, near Nassau, Germany.

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Jackson, Eric H., 1, Morley Road, Southport.

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King, Andrew, 4, Panmure Place, Edinburgh.

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Liverseege, John Francis, 73, Soho Street, Smethwick.

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MacBretney, Edmund George, F.C.S., Aire and Calder Glass Bottle Works Castleford, Yorkshire.

Marriott, Thomas Bruce, Spring Grove, Isleworth.

McCubbin, W., Mill Bank House, West Derby, Liverpool.

Mercer, Thomas, Great Hey, Edenfield, near Bury, Lancashire.

Miller, James Bruce, F.C.S., Rubislaw, Den North, Aberdeen.

Moore, C. H. R., 17, Great Tower Street, E.C.

Newman, G. I., Laurel Bank, Wilmslow, Cheshire.

Oddy, Robert W., 60, Waterhouse, Toad Lane, Rochdale.

Pauls, C. A., B.Sc., Rivington and Blackrod Grammar School, near Bolton.

Pike, Alfred Edridge, Westminster Hospital Medical School, Caxton Street, S.W.

Pilkington, George, Wood Bank, Bury, Lancashire.

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Purvis, John Edward, Hamilton Street, Heaton Norris, Stockport.

Radulowitz, D. W., Belgrade, Servia,

Ramage, Hugh, 10, Bridle Road, Crewe.

Read, Arthur A., F.C.S., Ventnor House, Honiton, Devon.

Reckitt, Ernest, F.C.S., Caen Wood Towers, Highgate.

Reeks, Trenham H., Assoc.R.S.M., 20, Perham Road, West Kensington, W.

Rhodes, Clement T., F.C.S., c/o Mrs. Emma Rhodes, Wesleyan School, Royton, near Oldham.

Rimmer, Harold, Church Walk, Ulverstone.

Rowden, W. C., 13, Crown Street, Newcastle-on-Tyne.

Salmon, H. J., 89, Sunny Hill Road, Streatham, S.W.

Sanderson, John, F.C.S., 57, Belsize Park Gardens, Hampstead, N.W.

Scrutton, Willis, J. C., 18, Billiter Street, E.O.

Shegog, Thomas Alexander, F.C.S., Royal College of Science, Dublin.

Short, Frederick William, 17, Bloomsbury Square, W.C.

Silvester, Harry, F.C.S., Malvern House, Handsworth, Birmingham.

Smith, Angus, F.C.S., 16, Wellington Street, Greenock.

Sohn, Charles E., 25, Beverley Road, Anerley, S.E.

Smith, Harry, 33, Withington Road, Whalley Range, Manchester.

Spargo, Herbert, 29, Mosley Street, Newcastle-on-Tyne.

Teanby, George W. A., 22, Grosvenor Place, Leeds.

Templeton, S., 12, Rutland Square, Dublin.

Terry, Hubert L., 13, Duke Street, Greenhays, Manchester.

Thorne, E. E. H., F.C.S., Bridgetown, Barbados.

Tocher, James F., 1, Chapel Street, Peterhead.

Towill, Edward John, 57, Rheinstrasse, Wiesbaden.

Vasey, S. A., F.C.S., Fillebrook, Leytonstone, Essex.

Walker, Frederick, 36, Kenilworth Road, Newcastle-on-Tyne.

Weeks, Henry Bridges, 38, Burnash Road, Plumstead. S.E.

White, Edmund, St. Thomas's Hospital, S.E.

White, John, 14, Temple Street, Birmingham.

Williams, William Lloyd, Galen Works, Wilson Street, New Cross, S.E.

Williamson, Sidney, F.C.S., Fairholme, Esher, Surrey.

Wilson, Harry, 88, Bellott Street, Cheetham, Manchester.

Winder, G. R., The Villas, Bramhall, near Stockport.

Wise, John Bailey, Assoc.R.C.Sc. I., 190, Bellfield Street, Glasgow.

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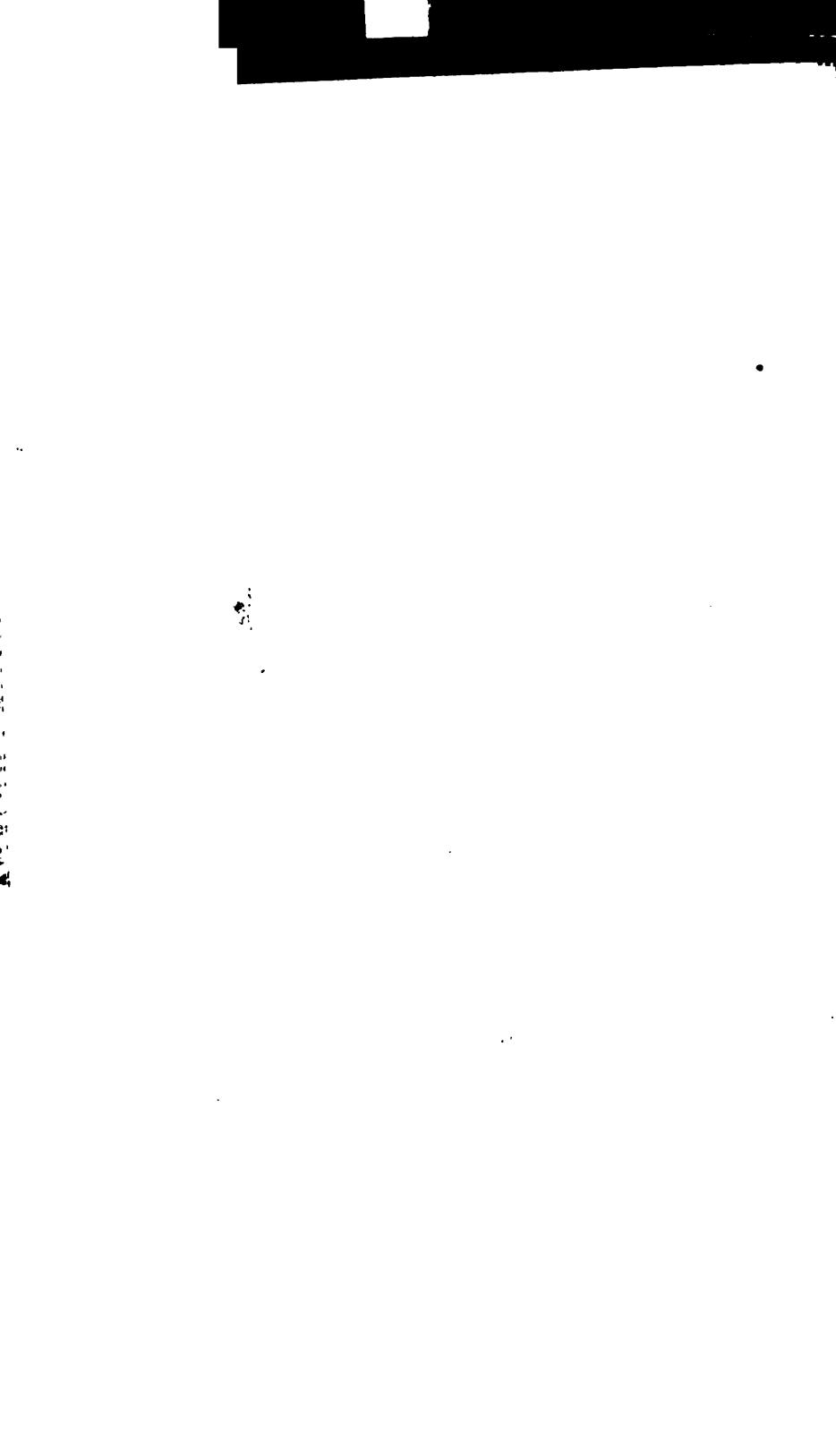
NAMES OF STUDENTS.

Ivatts, Harold, 21, Philsboro' Road, Dublin.

Mallalieu, Thomas Chapman, Albert Villas, Levenshulme, near Manchester.







INSTITUTE OF CHEMISTRY

OF

REAT BRITAIN AND IRELAND.

PROCEEDINGS.

PART II. 1890.

Annual General Meeting.

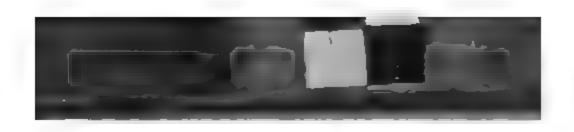
President's Address.

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1890.





PROCEEDINGS

OF THE

INSTITUTE OF CHEMISTRY

OF

GREAT BRITAIN AND IRELAND,

9, ADELPHI TERRACE, W.C.

CHARLES E. GROVES, Secretary.

PART II. 1890.

REPORT OF THE ANNUAL GENERAL MEETING,

BALANCE SHEET FOR 1889,

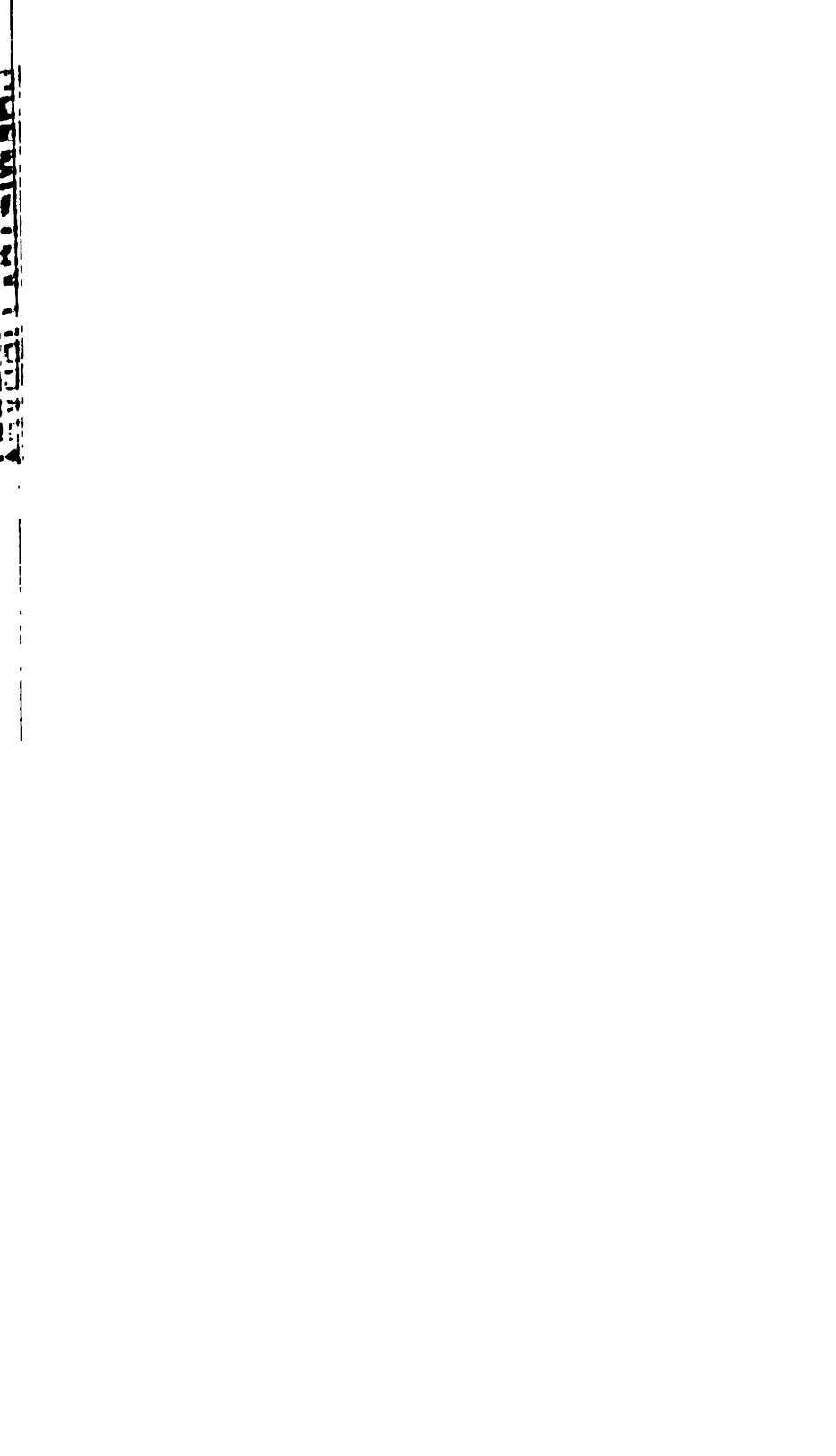
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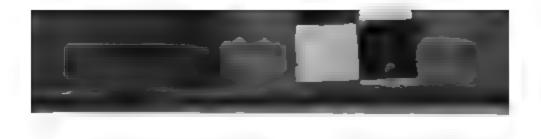
ADDRESS OF THE PRESIDENT,

Dr. JAMES BELL, F.R.S., &c.

ISSUED BY AUTHORITY OF THE COUNCIL.

April 21st, 1890.





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LIST OF OFFICERS AND COUNCIL FOR 1890.

PRESIDENT.

JAMES BELL, C.B., Ph.D., D.Sc., F.R.S.,

VICE-PRESIDENTS.

M. CARTEIGHE, F.C.S.
A. CRUM BROWN, M.D., D.Sc., F.R.S.
W. ODLING, M.A., M.B., F.R.S., &c.
W. RAMSAY, Ph.D., F.R.S.
T. STEVENSON, M.D., F.C.S., &c.
C. M. TIDY, M.B., F.C.S., &c.

TREASURER.

DAVID HOWARD, F.C.S.

ORDINARY MEMBERS OF COUNCIL.

- M A ADAMS, F.C.S.
- B. BANNISTER, F.C.S.
- J CARTER BELL, F.C.S.
- J. C. BROWN, D.Sc., F C.S.
- H. T. BROWN, F.C.S.
- C. E. CASSAL, F.C.S.
- P. CLOWES, D.Sc., F.C.S.
- R. H. DAVIES, F.C.S
- W R. DUNSTAN, M A., F.C.S.
- B. DYER, B.Sc., F C.S.
- A. E. FLETCHER, F.C.S.
- P. F. FRANKLAND, Ph.D., F.C S
- R. J FRISWELL, F.C S.
- OTTO HEHNER, F.C.S.

- J. F. HODGES, M.D., F.C.S.
- H. McLEOD, F.R.S. &c.
- R. MELDOLA, F.R.S., &c.
- J. PATTINSON, F.C.S.
- B. REDWOOD, F.C S.
- W R. SMITH, M.D., D.Sc.
- A. SMITHELLS, B.Sc., F.C.S.
- R. R. TATLOCK, F.C.S.
- F. L. TEED, D Sc., F.C.S.
- W. THORP, B.Sc., F.C S.
- T. E. THORPE, Ph D., F R.S., &c.
- T. TYRER, F.C.S.
- C. R. A. WRIGHT, D Sc., F.R.S., &c.

REGISTRAR AND SECRETARY.

C. E. GROVES, F.B.S., &c.

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39

REPORT

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ANNUAL GENERAL MEETING.

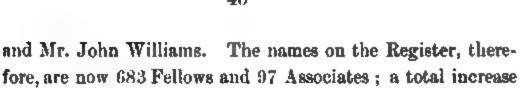
THE FOURTH ANNUAL GENERAL MEETING of the Institute of Chemistry of Great Britain and Ireland incorporated by Royal Charter, was held at Burlington House, on Saturday, the 1st March, 1890.

The Balance Sheet (see p. 42) having been laid before the Meeting by the Treasurer, it was received and adopted.

The PRESIDENT then delivered his Address (see p. 43.)

The REPORT OF THE COUNCIL was read by the Secretary as follows:—

At the Annual General Meeting held last year there were 685
Fellows and 83 Associates on the Register. Since then 20
Associates and 14 Fellows have been admitted, 4 of
the latter have been raised from the Associateship, whilst
3 Fellows and I Associate have resigned. The names of
3 Fellows and 1 Associate have been removed from the
Register for non-payment of subscriptions, and we have to
lament the decease of ten of our Fellows, namely, Dr. Warren
de la Rue, Mr. E. Maxwell Dixon, Mr. Ernest E. H. Francis,
Mr. F. Bowyer Miller, Dr. David S. Price, Dr. R. Romanis,
Dr. Edmund Ronalds, Mr. Joseph Stapleton, Mr. John Taylor,



Twenty-six Candidates were admitted to the Practical Examination held by the Examining Board at London, Birmingham Glasgow, and Manchester, and the 20 of these who passed were subsequently elected as Associates of the Institute.

of 12 Members during the past year.

The system of having the Examinations conducted by a Board of Examiners is found to work very satisfactorily; many of the candidates sent in note books, accompanied by the Professor's certificate that the work recorded therein had been performed under his supervision, or that of his assistants, although the regulations rendering this compulsory do not come into force until the present year.

Regulations for the admission of Students have been drawn up in accordance with Chapter VII., of the Bye Laws, by which Candidates over 17 years of age may be admitted to the Studentship of the Institute by the Council on the recommendation of a Fellow of the Institute with whom they are engaged in the study of Chemistry, or of a Professor of Chemistry at any of the Universities or chartered or incorporated Colleges or Schools, approved by the Council, at which the applicant for admission is studying.

The Council also has again to congratulate the Members on the present satisfactory financial position of the Institute.

The Institute is indebted to the President and Council of the Chemical Society for the use of their rooms during the past year.



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The Report of the Council having been received and adopted the Officers and Council for the ensuing year were elected (see p. 37,) Messrs. A. J. Greenaway and John Holmes acting as Scrutineers.

The CENSORS elected were Mr. David Howard, Dr. W. Odling Professor T. E. Thorpe and Dr. W. Ramsay.

Messrs. B. H. Brough, H. J. Helm, and F. J. Lloyd, were appointed Auditors.



STITUTE OF CHEMISTRY OF GREAT BRITAIN AND IRELAND.

INCORPORATED BY ROYAL CHARTER.

STATEMENT OF ACCOUNT AND BALANCE SHEET,

FROM 18T JANUARY TO SIST DECRMBER, 1869.

26 8. d. 10 10 10 10 10 10 10 10 10 10 10 10 10	3 10 0	41,550 19 5	None.	
Printing, Stationery, and Postage Advertisments Rent, Office, and Miscellaneous Expenses Corporation Duty Fees to Examiners, and Examination Expenses	Parliamentary Agents Cash in London and Deposit a/o £500 0 0 Westminster Bank, Current a/o 429 3 7 Slat Dec., 1889.	Tiabilities.	December 31st, 1889	H. J. HELM. FRANK L. TEED. WILLIAM THORP.
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Balance in Hand, 1st January, 1869 Entrance Fees 73 Associates' 1 Student's Registration Fee	::	S sects.	December 31st, 1889, Cash at Bank	Audited and found correct,



THE PRESIDENTS ADDRESS.

THERE is comparatively little new for me to bring before you on the present occasion.

The Institute has arrived at a period of its history when we can no longer look forward to any large accession in the number of its Members each year, and it will be seen from the Report of Council that since our last Annual General Meeting the total increase in the names on the Register amounts to 13 only. In future we shall have to look, almost exclusively, to the candidates for the associateship to augment our numbers, and, seeing that 20 Associates only have been admitted by examination, and that 17 names have been removed from the Register by death and other causes, the increase in the total members during the year would only have amounted to 3 if 10 applicants had not been admitted to the Fellowship without examination. In July last there were 28 Candidates who entered for the practical examination, and of these 26 presented themselves at the various centres on the day appointed and 20 passed in a satisfactory manner. Examination was conducted in accordance with the directions contained in the syllabus, and although the production of note books is not compulsory till the current year, 8 of the 26 Candidates sent in their note books for inspection.

Although the number on the Register is only thirteen in excess of last year, there need be no apprehension about the steady progress of the Institute, for, as the objects and advantages of it



become more widely known, a continually increasing desire will undoubtedly manifest itself among chemical students to pass the qualifying examination and become enrolled as Associates. In the meantime it cannot be too strongly urged upon our professorial members how important it is, in the interests of the promotion of chemical and general scientific education, that they should take every opportunity of bringing the Institute under the notice of their Students, and encourage them to prepare for passing the examination for the Associateship. The fact cannot be too strongly emphasised that the training prescribed by the Institute in theoretical and practical chemistry, physics, and mathematics, is essential for all competent chemists, the professorial and professional alike.

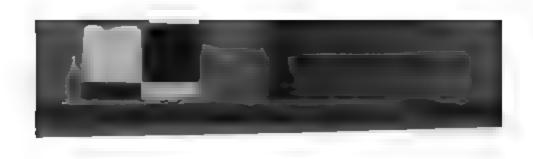
It is gratifying to find from the Treasurer's Report that the state of the finances of the Institute continues to be satisfactory. The total sum derived from the three sources of income, namely, annual subscriptions, fees on examination, and dividends on funds, amounts, in round figures, to £963. The total expense incurred during the year, principally for printing and stationery, for examinations, salaries, rent of office, &c., amounted to £621, being an excess of income over expenditure of £342. excess, considering the moderate amount of the annual subscription, is, perhaps, as much as might be reasonably expected; but it is obvious that it is not a sum with which we can afford to undertake any great popular developments of the functions of the There is every reason to be satisfied with the progress which the Institute has hitherto made; but all must feel that there is still much to be done to place it in the position which we should like to see it occupy. It is only a question of time, however, as the Institute is bound to advance in favour and position, as its influence upon the welfare and social standing of professional chemists becomes better undertood and appreciated, and the time

will soon come when an effort will have to be made to transfer it from its present somewhat undignified rooms in Adelphi Terrace to a suitable building where the work of the Institute can be conveniently carried on, and, if necessary, meetings of the Fellows can be held. The ideal of the habitation of the Institute is a building containing lecture hall, library, and other suitable apartments, towards the attainment of which we should aim; and, I feel sure, that any effort in this direction on the part of the Council will meet with the cordial approval of the Fellows.

The question of affording more frequent opportunities to the Fellows for meeting to discuss different topics, and to exchange their views on various subjects of interest to professional chemists, has engaged the serious attention of the Council during the past few months, and the subject is still pending for further consideration and decision. It is desirable that a matter of this kind should receive the fullest consideration and discussion before any decision is arrived at, and that no new departure should be taken which would not be likely to command the sympathy and support of the Fellows generally.

Within a comparatively short period after our incorporation it became apparent that there would be some difficulty in maintaining the popularity and prestige of the Institute with the Fellows as a mere registering body, especially when accompanied by the exaction of an annual subscription. This difficulty was apparently foreseen so far back as the year 1881, when Sir Frederick Abel observed in his annual address that:—

[&]quot;Mong the subjects which will certainly occupy the attention "of future Councils will be the questions whether more frequent "meetings of the Members may be organized with the prospect "of general approval and success; and whether some form of



"periodical publication may be issued, distinct in character from that of a purely scientific journal (the demand for which is so completely met by the Journal of the Chemical Society), but dealing with matters of special interest to practising chemists."

The opinion is held by many that there is an opening for a good comprehensive analytical journal in this country, and that the Institute might fairly become so far a teaching body as to undertake the publication of analytical papers in the form of proceedings; but, on the other hand, it is urged that the ground is already occupied by the Chemical Society, the Society of Chemical Industry, and the Society of Public Aualyists, and that these societies deal with all the subjects that would fall within the scope of the Institute. This, to a great extent, is undoubtedly true; but it is contended that analytical papers are now seldom read and discussed at the meetings of the Chemical Society, unless their bearing is of a purely scientific character; that the Society of Chemical Industry is mainly concerned with manufacturing processes, and the analytical papers brought before its meetings chiefly relate to the analysis of technical products, and not to general analytical processes, and that while the proceedings of the Society of Public Analysts cover a considerable range of analytical work, the objects of the Society are special, and its scope, as its name implies, limited, and cannot be expected to cover the same ground as the Institute, which represents all sections of professional chemists, and whose proceedings would neccessarily occupy a broad platform.

It must be admitted, however, that most of the papers and matters brought before the Society of Public Analysts and discussed, are such as might legitimately form part of the business of meetings of the Institute, and naturally there is a feeling that it would be undesirable for the Institute to encroach upon grounds.

already occupied by that Society, or to enter into competition with it, unless under conditions of mutual arrangement tending to the benefit of both.

The fact, however, must be borne in mind that the publication of a journal by the Institute would necessarily entail a greatly increased expenditure, and we have seen that the excess of income over the outgoings during the past year only amounted to £342, and it is doubtful whether with so limited an amount at our disposal, we should be justified in undertaking the issuing of a journal without first securing an addition to our income by increasing the amount of the annual subscription. I have no doubt however, that there would be little difficulty about increasing the subscriptions provided the opinion generally obtained that the holding of periodical meetings of members for reading and discussing analytical and other papers of interest to professional chemists, and the publication of the papers in the form of Proceedings, would confer real benefits on the Fellows and promote the elevation of the profession of consulting and analytical chemistry.

The settlement which I was able to announce at our last anniversary meeting of the question of the general scientific training of Candidates necessary for the purpose of qualifying for admission to the practical examination for the associateship, appears to have given general satisfaction, and not a single complaint has since been received by the Council on the subject from any Fellow.

The course of training agreed upon is undoubtedly one which is calculated to maintain the requisite standard of qualifications, and it is highly gratifying to find a general recognition of the necessity for insisting, as a preliminary condition for admission to the examination, upon a thorough systematic scientific training.



Although the Institute at present can offer few, if any, tangible advantages to Students, yet the Council deemed it desirable to prepare regulations in accordance with the Bye-Laws for the admission of young men to the Studentship, and to issue copies of the rules to the Fellows for their information and guidance. Fellows should make it a special object to induce young men studying for the chemical profession to connect themselves at as early a period as possible with the Institute, and thereby bring them to some extent under the sphere of its influence. Seven candidates have already been admitted, and it is hoped that through the exertions of Professors of Chemistry, and Fellows who have articled pupils, the number will soon be greatly increased.

The practice is still continued of sending a copy of the Register of Fellows to all Government Departments and public authorities, which have to deal with chemical appointments, and in any case in which an analyst has to be appointed, or a vacancy occurs, it would be desirable that Fellows should report the circumstances to the Secretary in order that the Council might take steps, if deemed expedient, to call the attention of the department or authority to the Institute as representative of the profession and to point out that its membership carries with it a guarantee of the qualifications of practical chemists enrolled upon its register. These remarks apply especially to the County Councils recently constituted, and I think an effort should be made to induce them to recognise the membership of the Institute as an indispensible qualification of a candidate for any chemical appointment which they may have to make.

In pursuance of the suggestion to which I referred last year, that it would be desirable to found either a Widow's or a Benevolent Fund in connection with the Institute, a Committee was



appointed to consider the subject, and report to the Conneil the result of their deliberations. The subject is still under the consideration of the Committee, but whatever form the fund takes, it must be founded and carried on apart from the Institute, as the terms of our Charter preclude us from appropriating any of the moneys of the Association for forming a widow's fund, or for use for benevolent purposes.

In any circumstances the real object would be to meet necessitous cases, and, therefore, the establishment of a Benevolent Fund is obviously the most desirable and possible, and if such a fund were once fairly started, we might reasonably look forward to making the scheme a success. The fund would be one to which any one could be asked to contribute, and in time we might reasonably expect occasional gifts for these benevolent purposes. Similar funds succeed in connection with other professions, and are instrumental in doing much good, and I do not see why the proposed fund, in connection with the Institute, should not prove a success.

Before proceeding farther in the matter, it was deemed advisable to send a copy of a circular to each Fellow and Associate, in order to ascertain their feelings on the subject.

It will be within the recollection of the Fellows that the Council arrived at the conclusion last year that it would be to the interests of the Institute to adopt a more stringent course with regard to the payment of the annual subscriptions, and a resolution was adopted directing the exclusion from the new Register of names of Members whose subscriptions were twelve months in arrear. This system, which is fair and reasonable, has been found to work so satisfactorily that the Council passed a similar resolution before the end of last year for the guidance of the Registrar in preparing the new Register recently issued.



Among the names whose deaths we have to lament, I cannot help specially referring to the loss which science has sustained by the decease of our venerable and much-beloved Member, Dr. Warren De la Rue. He was an ardent lover of science, and an earnest and successful investigator, as well as a liberal supporter of scientific institutions, and a generous contributor to benevolent and other praiseworthy objects, in connection with scientific life. In serving as a Member of our Council, I am sure others of his colleagues, like myself, must have been deeply impressed with his sound, practical business views, as well as with his kind and amiable manner, and it is worthy of note that his success, either as a man of business, or as a scientific investigator, in no way affected his kind and considerate demeanour towards his fellowmen.

OBITUARIES.

It will be seen from the Report of Council that the Institute has lost ten Fellows during the past year. The names of the deceased Fellows are:—Warren De La Rue, E. Maxwell Dixon, Ernest E. H. Francis, F. Bowyer Miller, David S. Price, R. Romanis, Edmund Ronalds, Joseph Stapleton, John Taylor, and John Williams. Short notices of some of these are appended:—

Warren De La Rue was born in Guernsey on January 18th, 1815, and was the son of Thomas De La Rue, the founder of the well known firm of manufacturing Stationers. He was educated at the College of St. Barbe, Paris, and entered his father's business at a comparatively early age. He always showed a great liking both for scientific pursuits and also for mechanics; and notwithstanding his business occupations, he found time to study Chemistry under Dr. Hofmann, at the Royal College of Chemistry, which



led to a life-long friendship between them. It was not chemistry only in which he was skilled; soon after its discovery by Jacobi and Spencer he practically applied electrotyping in the factory at Bunhill Row; and in conjunction with his friend, Dr. Hugo Muller, invented the chloride of silver battery; by means of this convenient source of electricity of high tension, they carried out a unique series of experiments on the electrical discharge in gases at the ordinary pressure, and studied the phenomena of the electrical arc. This battery gradually attained vast proportions. In 1881 Dr. De la Rue gave a lecture at the Royal Institution, in which a chloride of silver battery of 14,400 cells was used, and the phenomena of the discharge exhibited in a series of brilliant experiments.

His achievements in other directions were no less conspicuous. In conjunction with Mr. Edwin Hill, he invented the first envelope folding machine, which attracted crowds of spectators at the Great International Exhibition of 1851. His mechanical skill and general neatness and exactitude in all he did attracted him to practical astronomy; in the first instance, he devised improvements in the construction of reflecting telescopes, and erected at Canonbury, Islington, a 13-inch Newtonian, made in his own workshops after his own design. When mounted, he used it at first for making accurate drawings of Jupiter, Saturn, and Mars for micrometrical measurements, but whilst thus engaged, the employment of photography for the purpose suggested itself to him, resulting ultimately in the production of the beautiful pictures of the moon which are so well known.

In 1857 this telescope was removed to Cranford, and ultimately given by him to the University of Oxford. He was also concerned in the more recent applications of photography to astronomical purposes. In 1855 he designed and planned the Photoheliograph subsequently mounted at the Kew Observatory, and which was taken with the Eclipse Expedition to Spain in



1860, where he took charge of the photographic station at Rivabellosa. He also took an active part in the preparation for the Transit of Venus Expedition in 1874.

Warren De La Rue was elected a Fellow of the Royal Society in 1850, and was repeatedly Vice-President. He was first Secretary and the President of the Royal Astronomical Society, one of the original Members of the Chemical Society, and twice its President. He was also one of the original Fellows of the Institute, and a member of a very large number of Foreign Scientific Societies. He died at his residence in Portland Place on April 19th, 1889, at the age of 74 years.

Dr. David S. Price, the son of the late Dr. Price, of Margate, died at that seaside watering place towards the close of 1888. He was well known for his researches and intimate knowledge of aniline dyes and other branches of chemical manufacture, and for his acquaintance with the patent laws and patent literature, especially with respect to chemistry. His long connection with the Crystal Palace is well known; the Technological Museum at that place was due to his energy.

Dr. Robert Romants, a chemical examiner to the Burma Government, and Professor at the Rangoon College, was born in 1854, and was son of the late M. C. S. Romanis, formerly of St. Petersburg, but latterly residing in Leith. He was educated at Edinburgh University and in Germany, and at one time was on the staff at Clifton College. During the Burmese war he was on the staff of General Prendergast, and made a special report on the resources of the recently acquired territory. He died in Rangoon of cholera in the early part of 1889. He was a Fellow of the Linnman and Chemical Societies, and a Fellow of the Institute of Chemistry.



Dr. EDMUND RONALDS was born at Canonbury, London, in 1819. His early education in England completed, he went abroad, and studied successively at Giessen, Jena, Berlin, Heidelberg, Zurich, and Paris. In 1840 he returned to England, and held the Lectureships in Chemistry successively at St. Mary's Hospital, and at the Middlesex Hospital. In 1849 he became Professor of Chemistry in Queen's College, Galway, but resigned it in 1856, when he took over the Bonnington Chemical works, where the bye-products of the Edinburgh Gasworks are dealt with. He was of late years afflicted with very bad health, and died on 9th September, 1889.

Joseph Stapleton, F.C.S., was born at Chickingly Heath near Dewsbury, in 1853. His name is associated with a large number of useful original investigations, mostly dealing directly with manufacturing processes. A valuable method of removing tellurium from bismuth, and an improved apparatus for the detection of nitrites in water are due him; he worked for a long time with Professor Attfield, conducting an extended series of experiments with marked ability. His main work was associated with the Veloplastic Company, whose object was the manufacture of a species of carriage leather; and, indeed, the ultimate cause of his death appears to have been a disorder which has been conjectured, rightly or wrongly, to have arisen from the deleterious effects of boiled skins used in the manufacture. He died on 16th April, 1889, in Dublin.

John Williams, F.C.S., F.I.C., was the son of John Williams, who was formerly Secretary of the Royal Astronomical Society and other learned Societies. Mr. Williams was born in London on March 9th, 1824, and was for many years assistant to the late Mr. Morson, and subsequently for nearly forty years partner with Mr. W. King Hopkin, in the firm of Hopkin



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and Williams. Mr. Williams was for seventeen years a Member of the Council of the Pharmaceutical Society of Great Britain, for three of years of which he acted as Treasurer, and for three years he filled the office of President of that Society. He was also a Vice-President of the Society of Chemical Industry, and a Fellow of the Institute from its commencement. Mr. Williams died at his residence in Warwick Gardens, S.W., on Sunday, March 3rd, within a few days of completing his 65th year.



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INSTITUTE OF CHEMISTRY

REAT BRITAIN AND IRELAND.

PROCEEDINGS.

PART III. 1890.

Zondon:

BINTED BY A. P. Blundell, Taylor & Co., 177, Upper Thames St., E.C.

1890.

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PROCEEDINGS

OF THE

INSTITUTE OF CHEMISTRY

OF

GREAT BRITAIN AND IRELAND.

PART 111. 1890.

Prospectus;

Admission of Students to the Associateship;

Examinations;

Supplement to Register, &c.

Zondon:

A. P. BLUNDELL, TAYLOR & Co., 177, UPPER THAMES STREET, E.C.

1890.





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REGULATIONS

FOR THE ADMISSION TO THE ASSOCIATESHIP OF

STUDENTS OF THE INSTITUTE

who are engaged in the practice of Chemistry in the Laboratory of a Fellow of the Institute.

Every such Candidate for the Associateship will be required to produce evidence—

- (1) That he is not less than twenty-one years of age.
- (2) That he has been engaged for four years in the practice of Chemistry in the Laboratory of a Fellow of the Institute, during at least two years of which time he has been entered as a Student of the Institute, and has regularly attended systematic courses of instruction in Theoretical and Practical Chemistry, Physics, and Elementary Mathematics in some University, College or School approved by the Council. Students of the Institute will be held to have satisfied these conditions as to systematic training:
 - a By attending at least 80 Lectures on "Theoretical Chemistry" (including Inorganic and Organic) during the 2 years.
 - b For "Practical Chemistry," Laboratory Work during the 2 years, of two Academic years, 3 days in each week, and at least 5 hours each day.
 - c For "Physics." Attendance on at least 50 Lectures on Physics, and work in the Physical Laboratory of at least 100 hours during the 2 years.
 - d For "Elementary Mathematics," Euclid, Books I., II. and III. Algebra to Quadratic Equations; Ratio and Proportion; Plain Trigonometry to solutions of triangles; heights and distances; area of a triangle; use of logarithms.

MEETINGS OF COUNCIL.

THE COUNCIL elected on the First of March has held the usual meetings, with an average attendance of 16 at each meeting. There have been 23 Committee Meetings, at which, besides routine business, important matters affecting the welfare of the Institute have been fully discussed.

The Council has most carefully considered the question as to the amount of Collegiate training required of those candidates who are engaged in the practice of Chemistry in the Laboratory of a Fellow of the Institute, in accordance with Sec. 2 of the "Prospectus," before they can be admitted to the practical examination of the Institute. This section of the Prospectus prescribes that every such candidate must produce evidence that he has been engaged for four years in the practice of Chemistry in the Laboratory of a Fellow of the Institute, during at least two years of which time he has been entered as a Student of the Institute, and has regularly attended systematic courses of instruction in Theoretical and Practical Chemistry, Physics, and Elementary Mathematics, in any one or more of the Universities or chartered or incorporated Colleges or Schools approved by the Council. The text of these "REGULATIONS FOR STUDENTS OF THE INSTITUTE," is appended, and copies may be obtained on application to the Secretary.



UNIVERSITIES AND COLLEGES

APPROVED BY

THE COUNCIL OF THE INSTITUTE.

*

Aberdeen	The University.
Aberystwyth	University College
Bangor	University College.
Belfast	Queen's College.
Birmingham	The Mason College.
Bristol	University College.
Cambridge	The University.
Cardiff	University College.
Cork	Queen's College.
Dublin	Royal College of Science for Ireland.
D **********	Trinity College.
Dundee	University College.
Edinburgh	The University.
Glasgow	The University.
** ********	Anderson's College.
Leeds	The Yorkshire College.
Liverpool	University College.
London	City and Guilde Institute, Central Institution.
11	" Finsbury Technical College.
,,	King's College.
,,	Royal College of Science.
,,	University College.
Manchester	The Owens College.
Newcastle-on-Tyne	The Durham College of Science.
Nottingham	University College.
Oxford	The University.
Sheffield	Firth College.

St. Andrew's The University.

EXAMINATION IN PRACTICAL CHEMISTRY.

The Examination in Practical Chemistry, which was held on July 14th and following days, was conducted by the Board of Examiners, namely:—

Dr. W. W. J. NICOL Birmingham.

Professor W. N. HARTLEY, F.R.S. Dublin.

Dr. E. J. Mills, F.R.S. Glasgow.

Mr. Watson Smith Manchester.

Professor J. MILLAR THOMPSON ... London.

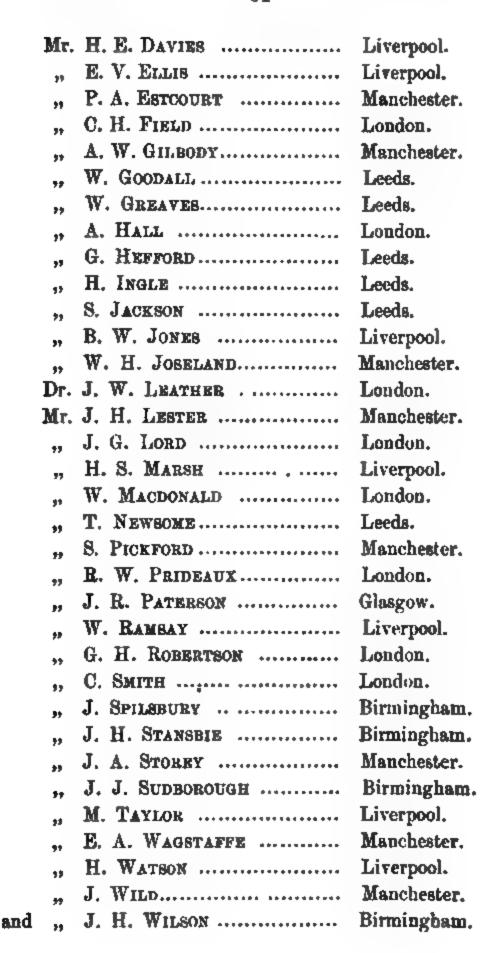
ASSISTED BY

Mr. C. H. Bothamley Leeds.

Examinations were held at six centres, namely, Birmingham, Glasgow, Manchester, Leeds, Liverpool and London, and as the regulations relating to the production of note books were compulsory this year, the candidates sent in their note books, accompanied by the Professor's certificate that the work contained in it had been performed under his supervision, or that of his assistants. In most cases these were well kept.

The number of Candidates who entered was 43, and they all presented themselves for Examination, namely, 11 at Liverpool, 10 at Manchester, 9 at London, 8 at Leeds, 4 at Birmingham and 1 at Glasgow. All of them passed the Examination in a satisfactory manner, and the following List contains their names, and that of the centres at which they were Examined.

Mr.	J. Anderson	London.
"	F. Boyce	Leeds.
27	H. Broadbent	Leeds.
"	F. Brownsword	Manchester.
"	A. CAREY	Liverpool.
"	G. C. CLAYTON	Liverpool.
77	J. T. Conroy	Liverpool.
"	A. W. CROSSLEY	Manchester.
"	L. Crossley	Liverpool.



The Examinations were alike at all the Centres, and the exercises set the same. Those in Qualitative Analysis comprised—

- (1) An alloy containing tin, lead, antimony, and a small quantity of arsenic.
- (2) Recognition, by practical tests, of two substances given, namely, acetate of morphine and salicylic acid.
- (3) The candidates also had to prepare the double copper ammonium chloride, CuCl₂,2NH₄Cl,2H₂O, from sulphate of copper, and of course the usual laboratory reagents. Fifty grams of sulphate of copper was given to each candidate for this purpose and he had to obtain a good yield of the well crystallised salt free from sulphuric acid, and then to examine quantitatively the effect of heating it at 100°

In Quantitative Analysis the following exercises were set:—

- 1. Volumetric estimation of silver in a silver copper alloy (80 %, Ag.); a standard solution of sodium chloride to be prepared.
- 2. Either of the two following exercises at the discretion of the Examiner:—
 - (a) Sodium Phosphate (Cryst:). To determine the soda and phosphoric acid separately.
 - (b) Copper Sulphate (Cryst:). To determine the copper, sulphuric acid, loss at 100°, and fifth molecule of H₂O.
- 3. To examine an organic substance, nitronapthalene, qualitalively for nitrogen, and to estimate the carbon and hydrogen by combustion.

Judging from the work generally, many of the candidates have not had a sufficiently careful training in Qualitative Analysis. As qualitative analyses which are executed in an imperfect manner lead to inaccurate and even worthless results when they serve as the preliminary examination to quantitative



work, it is of the highest importance that candidates for the Associateship should give special attention to Qualitative Analysis.

The quantative work was, as a rule, well done, and the "preparations" were carefully made.

FELLOWS AND ASSOCIATES.

Since the Register went to press nine Fellows and thirty-one Associates have been elected by the Council, and twelve Students have been admitted.

The names and addresses of those who have been formally admitted are as follows:—

FELLOWS.

Barry, T. D. Collis, M.D., Grant Medical College, Bombay.

Eastes, Ernest John, 67, Romilly Road, Finsbury Park, N.

Gray, George Watson, 14, Argyle Road, Garston, near Liverpool.

Hunter, John, School of Medicine, Minto House, Edinburgh.

Leather, J. Walter, 15, Bradgate Road, Catford, S.E.

Short, Frederick W., 17, Bloomsbury Square, W.C. Spilsbury, James, 4, Lynton Road, Crouch End, N. Stansbie, J. H., 44, Summer Lane, Birmingham.

White, J. Isasboo, Rangoon College, Rangoon, Burma.

ASSOCIATES.

Boyce, Frank, 4, Queen Square, Leeds.
Broadbent, Harry, 31, Victoria Terrace, Belle Vue Road, Leeds.
Brownsword, Frank, Heaton Moor, near Stockport.



Crossley, Arthur W., Benteliffe, Accrington, Lancashire.

Davies, Herbert E., Royal Institution Laboratory, Liverpool.

Ellis, E. Victor, Oughtibridge, Sheffield.

Fletcher, Dugald, 2, Church Street, Gilshochill, Glasgow.

Gilbody, A. W., Universitäts Laboratorium, Munich, Germany.

Goodall, W., Alma House, Pudsey, near Leeds.

Greaves, W., Mire Barf, Ripon, Yorkshire.

Hall, A., 34, Bishopsgate Street, E.C. Hefford, George, Jun., Headingly, Leeds.

Ingle, Harry, The Crookes, Pool, near Leeds.

Jackson, Samuel, 36, Gladstone Street, Keighley, Yorkshire.

Jones, Barton W., Hooton Grange, near Chester.

Joseland, Walter H., Chemical Laboratory, Owens College, Manchester.

Lester, J. H., Penrith.

Lord, John G., 4, St. Anne's Villas, Notting Hill.

MacDonald, William, 109, Crofton Road, Peckham, S.E.

Paterson, J. Rymer, 10, Millerfield Place, Edinburgh.

Pickford, Samuel, Brier Grove, Mellor, near Stockport.

Prideaux, R. M., 9, Vyvyan Terrace, Clifton, Bristol.

Ramsay, William, 20, Brock Street, Kirkdale, Liverpool.

Robertson, G. H., 30, Hemstall Road, West Hampstead, W.

Smith, Claude, King's College, W.C.

Storey, James A., Moorside, Lancaster.

Sudborough, J. J., 111, Strafford Road, Birmingham.



Taylor, Malcolm, Forest Road, Claughton, Birkenhead.

Wagstaffe, E. A., 15, Parkfield Street, Rusholme, Manchester. Watson, Henry, 29, Deane Road, Fairfield, Liverpool.

STUDENTS.

Cresswell, John, County Laboratory, Southampton.

Danziger, Henry, 34, Camp Street, Lower Broughton, Manchester.

Hardwick, W. R., College Road, Crosby, Liverpool.

Hill, H. F., 149, Bow Road, E.

Hobson, Edwin, c/o Messrs. Cannon & Newton, 18 and 19, Fenchurch Street, E.C.

Mallalieu, Thomas Chapman, Albert Villas, Levenshulme, Manchester.

Pearman, Thomas H., 9, Broad Street, Bloomsbury.

Styles, Robert C., Knockhall, Greenhithe, Kent.

Thomason, W., North Road, St. Helen's, Lancashire. Tomlinson, F., Albert View, Heaton Moor, near Stockport.

Welchman, Frank E., Westminster Hospital Medical School. Wyatt, T. M., 20, Queen Square, W.C.

This list is given in duplicate over leaf, so that it can be detached and inserted in the "Register" (Proceedings, Part I., 1890) as a supplement.

SUPPLEMENT TO REGISTER, 1890.

FELLOWS.

Barry, T. D. Collis, M.D., Grant Medical College, Bombay.

Eastes, Ernest John, 67, Romilly Road, Finsbury Park, N.

Gray, George Watson, 14, Argyle Road, Garston, near Liverpool.

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Broadbent, Harry, 31, Victoria Terrace, Belle Vue Road, Leeds.

Brownsword, Frank, Heaton Moor, near Stockport.

Conroy, James T., B.Sc., The Hollies, Montpellier Crescent, New Brighton, Cheshire.

Crossley, Arthur W., Bentcliffe, Accrington, Lancashire.

Davies, Herbert, E., Royal Institution Laboratory, Liverpool.

Ellis, E. Victor, Oughtibridge, Sheffield.

Fletcher, Dugald, 2, Church Street, Gilshochill, Glasgow.

Gilbody, A. W., Universitäts Laboratorium, Munich, Germany.

Goodall, W., Alma House, Pudsey, near Leeds.

Greaves, W., Mire Barf, Ripon, Yorkshire.

Hall, A., 34, Bishopsgate Street, E.C.

Hefford, George, Jun., Headingley, Leeds.

Ingle, Harry, The Crookes, Pool, near Leeds.

Jackson, Samuel, 36, Gladstone Street, Keighley, Yorkshire.



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Storey, James A., Mooreide, Lancaster.

Sudborough, J. J., 111, Strafford Road, Birmingham.

Taylor, Malcolm, Forest Road, Claughton, Birkenhead.

Wagstaffe, E. A., 15, Parkfield Street, Rusholme, Manchester.

Watson, Henry, 29, Deane Road, Fairfield, Liverpool.

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Mallalieu, Thomas Chapman, Albert Villas, Levenshulme, Manchester.

Pearman, Thomas H., 9, Broad Street, Bloomsbury.

Styles, Robert C., Knockhall, Greenhithe, Kent.

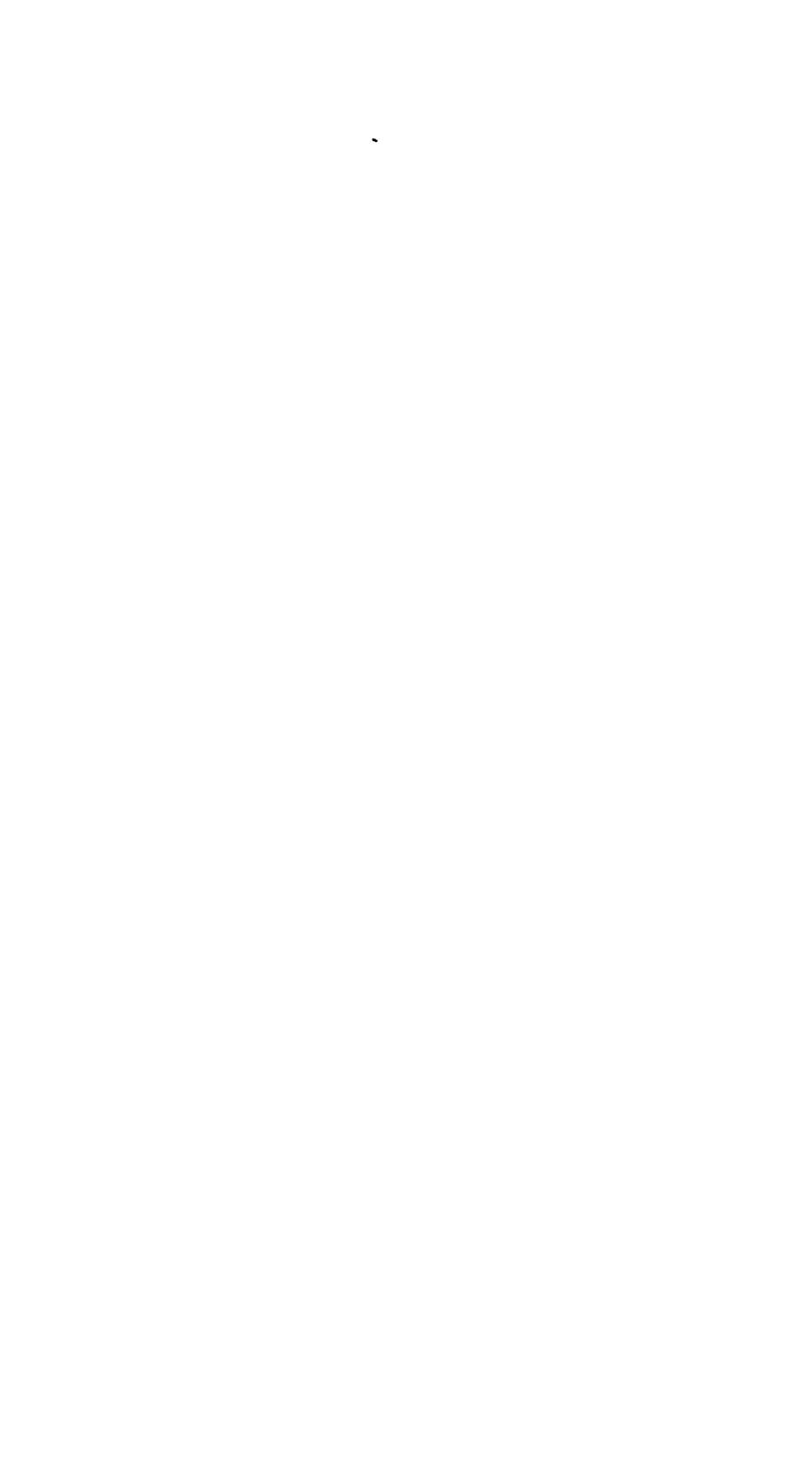
Thomason, W., North Road, St. Helen's Lancashire.

Tomlinson, F., Albert View, Heaton Moor, near Stockport.

Welchman, Frank E., Westminster Hospital Medical School.

Wyatt, T. M., 20, Queen Square, W.C.





INSTITUTE OF CHEMISTRY

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PROCEEDINGS

OF THE

INSTITUTE OF CHEMISTRY

OF

GREAT BRITAIN AND IRELAND.

PART I. 1891.

REGISTER FOR 1891.

ssued by Authority of the Council,

CHARLES E. GROVES,

Registrar and Secretary,

9, Adelphi Terrace, W.C.

Oth January, 1891.

. . • . Fellows and Associates are requested to send immediate notification of change of address to the Secretary.



NAMES OF FELLOWS.

Fellows who have paid Life Compositions are marked *

Abel, Sir Frederick A., C.B., D.C.L., D.Sc., F.R.S., V-P.C.S., 40, Cadogan Place, S.W.

Abney, Capt. W. W., F.R.S., F.C.S., Welleslie House, Wetherby Place, S.W.

Abraham, Alfred Clay, F.C.S., Stanley Rock, St. George's Mount, New Brighton, Cheshire.

Ackroyd, William, M.Ph.S., Borough Laboratory, Crossley Street, Halifax.

Acworth, Joseph J., Ph.D., F.C.S., Sheldmont, Shootup Hill, Brondesbury, N.W.

Adams, Matthew Algernon, F.C.S., Maidstone.

Adeney, Walter Ernest, F.C.S., Royal University, Dublin.

Adrian, Huskisson, Rev., M.A., Reading School, Berkshire.

Aikman, C. M., M.A., B.Sc., F.R.S.E., F.C.S., Technical College, and 183, St. Vincent Street, Glasgow.

Alcock, Frank Harris, F.C.S., 9, Broad Street Corner, Birmingham.

Alison, Robert Edward, 32, Brooke Street, Holborn, E.C.

Allen, Alfred Henry, F.C.S., 67, Surrey Street, Sheffield.

Angell, Arthur, Ph.D., County Laboratory, Southampton.

Angell, John, F.C.S., 81, Ducie Grove, Oxford Road, Manchester.

Archbutt, Leonard, F.C.S., Chemical Laboratory, Midland Railway Company, Derby.

Armstrong, H. E., Ph.D., F.R.S., F.C.S., 55, Granville Park, Lewisham, S.E., and Central Institution, Exhibition Road, S.W.

Ashby, Alfred, Town Hall, Reading.

Ashwell, J. R., F.C.S., 111, Waterloo Crescent, Nottingham.

Atkinson, Alexander John, 44, Loudoun Square, Cardiff.

Atkinson, Robert William, B.Sc., F.C.S., 44, Loudoun Square, Bute Road, Cardiff.

Attfield, Professor John, Ph.D., F.R.S., F.C.S., 17, Bloomsbury Square, W.C.

Audley, James A., Assoc. N.S.Sc., F.C.S., Cobridge, Stoke-on-Trent.

Babbington, Frederick W., Laboratory, Inland Revenue Department, Ottawa, Canada.

Baker, Charles Kerslake, Assoc.R.S.M., 46, High Street, Shesiield.

Baker, Harry, F.C.S., The Aluminium Co., Oldbury, Birmingham.

Ball, Edwin Jennings, Ph.D., F.C.S., Metallurgical Laboratory, Science Schools, South Kensington, S.W.

Bamber, Henry Kelway, F.C.S., 5, Westminster Chambers, Victoria Street, S.W.

Bannister, Richard, F.C.S., Laboratory, Somerset House, W.C.

Barbour, Thomas Fraser, F.C.S., Clydesdale Chemical Manufacturing Company, Robertson Lane, Glasgow.

Barnes, Joseph, 149, Marl Terrace, Accrington.

Barnett, Francis T., Assoc.R.S.M., 15, Stanley Street, Manchester.

Barnett, Robert William, Assoc.R.S.M., 148, Steade Road, Abbeydale, Sheffield.

Barret, Edward Louis, B.Sc., F.C.S., 192, Belsize Road, N.W.

Barry, T. D. Collis, M.D., Grant Medical College, Bombay.

Bascombe, Frederick, 3, Grand Promenade, Brixton Road, S.W.

Bassett, Henry, F.C.S., 26, Belitha Villas, Barnsburg, N.

Baynes, James, Ph.D., F.C.S., Royal Chambers, Scale Lane, Hull.

Beckett, George H., F.C.S., 133, Bewsey Road, Warrington.

Beilby, George, F.C.S., St. Kitt's, Slateford, Scotland.

Bell, Chichester A., B.A., M.B., F.C.S., 94, Warwick Gardens, Kensington, W.

Bell, James, C.B., Ph.D., D.Sc., F.R.S., F.C.S., Laboratory, Somerset House, W.C.

Bell, J. Carter, Assoc.R.S.M., F.C.S., The Cliff, Higher Broughton, Manchester.

Bemrose, Joseph, F.C.S., 56, St. Famille Street, Montreal, Canada.

Bendix, David, F.C.S., The British Alizarine Co., Silvertown, Victoria Docks, E.

Benger, Frederick Baden, F.C.S., 7, Exchange Street, Manchester.

Beringer, Cornelius, F.C.S., 9, West End, Redruth, Cornwall.

Beringer, John Jacob, Assoc. R.S.M., F.C.S., Roskear, Camborne, Cornwall.

Bernays, Professor Albert J., Ph.D., F.C.S., St. Thomas's Hospital, S.E.

Berridge, H. Dudley, F.C.S., 203, Belle Vue Road, Leeds.

Berry, Edward Elhanan, F.C.S., Mansion House Chambers, 20. Bucklersbury, E.C.

Best, Thomas F., F.C.S., 64, Park Street, Southwark, S.E.

Bevan, John W., F.C.S., c/o Sir James Murray & Son, Temple Street.

Dublin.

Bickerdike, William Edward, F.C.S., Clayton Grange, Whilpshire, nr. Blackburn.

Bicket, John Hughes, F.C.S., Medical College, London Hospital.

Biggart, John William, F.C.S., 29, Cathcart Street, Greenock.

Billing, Henry Samuel, F.C.S., Messrs. Burnard & Alger, Plymouth Chemical Works, Plymouth.

Bischof, Professor Gustav, F.C.S., 4, Hart Street, Bloomsbury, W.C.

Bloxam, Arthur George, F.C.S., The Goldsmiths Technical Institute, New Cross, London, N.

Bloxam, W. P., B.Sc., F.C.S., Royal Naval College, Greenwich, S.E.

Blunt, Thomas Porter, M.A., F.C.S., Wyll Cop, Shrewsbury.

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Dreaper, W. P., Messrs. Grant & Co., Ponder's End.

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Ellis, E. Victor, Oughtibridge, near Sheffield.

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Greaves, William, Mire Barf, Ripon, Yorkshire.

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Gibbins, Cecil, Grasmere, Bristol Road, Birmingham.

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Ivatts, Harold, 33, Mountjoy Square East, Dublin.

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Pearmain, Thomas H., The Laboratory, Apothecaries' Hall, Blackfriars, E.C.

Styles, Robert C., Knockball, Greenhithe, Kent.

Thomason, W., North Road, St. Helens, Lancashire.

Tomlinson, F., Albert View, Heaton Moor, near Stockport.

Welchman, Frank E., Westminster Hospital Medical School, Caxton Street, S.W.

Wyatt, T. M., 20, Queen Square, W.C.

Wright, Sidney B., 43, Holborn Viaduct, E.C.



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Wright, Sidney B., 43, Holborn Viaduct, E.C.

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INSTITUTE OF CHEMISTRY

OF

GREAT BRITAIN AND IRELAND.

PROCEEDINGS.

PART II. 1891.

Annual General Meeting.

President's Address.

Zondon :

PRINTED BY A. P. BLUNDELL, TAYLOR & Co., 177, UPPER THAMES ST., E.C.

1891.





PROCEEDINGS

OF THE

INSTITUTE OF CHEMISTRY

OF

GREAT BRITAIN AND IRELAND,

9, ADELPHI TERRACE, W.C.

CHARLES E. GROVES, Secretary.

PART II. 1891.

REPORT OF THE ANNUAL GENERAL MEETING,

BALANCE SHEET FOR 1890,

AND

ADDRESS OF THE PRESIDENT,

Dr. JAMES BELL, F.R.S., &c.

ISSUED BY AUTHORITY OF THE COUNCIL.

April 29th, 1891.



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LIST OF OFFICERS AND COUNCIL FOR 1891.

PRESIDENT.

W. A. TILDEN, D.Sc., F.R.S., &c.

VICE-PRESIDENTS.

J. BELL, C.B., Ph.D., D.Sc., F.R.S., &c. M. CARTEIGHE, F.C.S.

A. CRUM BROWN, M.D., D.Sc., F.R.S.

E. FRANKLAND, D.C.L., F.R.S., &c.

W. RAMSAY, Ph.D., F.R.S., &c.

T. STEVENSON, M.D., F.C.S., &c.

TREASURER.

DAVID HOWARD, F.C.S.

ORDINARY MEMBERS OF COUNCIL.

- M. A. ADAMS, F.C.S.
- A. H. ALLEN, F.C.S.
- R. BANNISTER, F.C.S.
- J. CARTER BELL, F.C.S.
- J. C. BROWN, D.Sc., F.C.S.
- C. E. CASSAL, F.C.S.
- R. H. DAVIES, F.C.S.
- W. R. DUNSTAN, M.A., F.C.S.
- A. DUPRÉ, Ph.D., F.R.S., &c.
- BERNARD DYER, B.Sc., F.C.S.
- R. J. FRISWELL, F.C.S.
- J. F. HODGES, M.D., F.C.S.
- J. HUGHES, F.C.S.
- G. H. MAKINS, F.C.S.

- H. McLEOD, F.R.S., &c.
- F. J. M. PAGE, B.Sc., F.C.S.
- R. T. PLIMPTON, Ph.D., F.C.S.
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- C. O'SULLIVAN, F.R.S., &c.
- R. R. TATLOCK, F.C.S.
- F. L. TEED, D.Sc., F.C.S.
- J. MILLAR THOMSON, F.C.S.
- W. THORP, B.Sc., F.C,S.
- T. E. THORPE, Ph.D., F.R.S., &c.
- T. TYRER, F.C.S.
- E. W. VOELCKER, Assoc. R.S.M.
- C. R. A. WRIGHT, D.Sc., F.R.S., &c.

REGISTRAR AND SECRETARY.

C. E. GROVES, F.R.S., &c.



REPORT

OF

ANNUAL GENERAL MEETING

THE FIFTH ANNUAL GENERAL MEETING of the Institute of Chemistry of Great Britain and Ireland incorporated by Royal Charter, was held at Burlington House, on Monday, the 2nd March, 1891.

The Balance Sheet (see p. 44.) having been laid before the Meeting by the Treasurer, it was received and adopted.

The President then delivered his Address (see p. 45.)

The REPORT OF THE COUNCIL was read by the Secretary as follows:—

At the Annual General Meeting held last year there were 684
Fellows and 97 Associates on the Register. Since then 39
Associates and 22 Fellows have been admitted, 10 of the latter having been raised from the Associateship, whilst 2
Fellows and 1 Associate have resigned; 12 Students have also been admitted. The names of 3 Fellows and 2 Associates have been removed from the Register for non-payment of subscriptions, and we have to lament the decease of eleven of our Fellows, namely, Mr. H. B. Brady, F.R.S., Professor T. Carnelley, Mr. John Collins, Mr. John B. Hutcheson, Mr. E. Chambers Nicholson, Mr. T. R. Ogilvie, Dr. David Page, Dr. R. Romanis, Dr. Henry Smith, Mr. Alexander Y. Stewart and Mr. Henry H. Walker. The names on the

Register therefore are now 690 Fellows and 123 Associates; a total increase of 32 Members during the past year. In addition there are 14 Students on the Register.

Examinations were held at six centres in July last, namely. Birmingham, Glasgow, Manchester, Leeds, Liverpool and London, at which 43 Candidates presented themselves. These all passed and were subsequently elected Members of the Institute.

This is the first Examination at which it was compulsory for the Candidates to send in note books duly attested by the Professor's certificate that the work recorded therein had been performed under his supervision, or that of his assistants. It is hoped that this system, by which candidates are required to submit the notes of work done, to the Board of Examiners for inspection, will induce Students not only to adopt a more careful and systematic method of conducting their laboratory work, but also of recording results in their note books. The Board of Examiners report that the candidates did not appear to be so carefully trained in Qualitative as in Quantitative Analysis, and point out that it is of the highest importance that Candidates for the Associateship should give special attention to Qualitative Analysis.

Detailed Regulations for the admission to the Associateship of those Students of the Institute who are engaged in the practice of Chemistry in the Laboratory of a Fellow of the Institute, have also been issued. These have been prepared in accordance with Par. 2 of the "Prospectus of Qualifications required of Candidates for admission to the Institute of Chemistry as Associates."

The attempt to form a Benevolent Fund has been unsuccessful.

A circular was sent to each Member of the Institute, asking

whether he was in favour of the formation of such a fund, but only 172 answers were received (from about one-fifth of the Members), and of these only 130 were in favour of the scheme. As such a fund could only be successful if it were well supported by a large majority of the Members, it was considered unadvisable to proceed further in the matter.

- Two Committees have been appointed, namely, one, the "Committee on State Chemistry," and the other the "Conference Committee" to consider the suggestion made by the President in his Annual Address last year, that one or more Conferences or meetings should be held annually, to discuss topics of interest to professional chemists. It has been decided to hold two such meetings annually for this purpose.
- The Council also has again to congratulate the Members on the present satisfactory financial position of the Institute.
- The Institute is indebted to the President and Council of the Chemical Society for the use of their rooms during the past year.
 - The Report of the Council having been received and adopted, the Officers and Council for the ensuing year were elected (see p. 39.) Messrs. A. J. Greenaway and G. N. Stoker, acting as Scrutineers.
 - The CENSORS elected were Mr. David Howard, Dr. James Bell Mr. M. Carteighe, and Professor T. E. Thorpe
 - Messrs. B. H. Brough, J. Holmes, and F. J. Lloyd, were appointed Auditors.

ITUTE OF CHEMISTRY OF GREAT BRITAIN AND IRELAND.

INCORPORATED BY ROYAL CHARTER.

STATEMENT OF ACCOUNT AND BALANCE SHEET,

FROM INT JANUARY TO SIRT DECEMBER, 1890.

Advertisments Advertisments Rent, Office, and Miscellaneous Expenses Fees to Examiners, and Examination Expenses Salaries and Wages Cash in London and Westminatar Bank, 31st Dec., 1890 H. J. Helm, H. J. Helm,	
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PRED. J. LANTO.

THE PRESIDENT'S ADDRESS.

THE proceedings of the Institute during the past year have been comparatively uneventful, so that, on this the last occasion of my occupying the Presidential chair, I have very few matters of special interest to bring before you.

It will be observed from the Report of Council that the Institute continues to make steady progress, and, I think, I may fairly venture to congratulate the Fellows upon its satisfactory position. The total increase in the number on the register amounts to 32, as compared with 13 last year, and 43 candidates presented themselves for examination, against 28 in the previous There is a notable contrast between the results of the last two examinations. In the year before last nearly 30 per cent. of those who presented themselves for examination were rejected, while last year the whole of the 43 candidates who submitted themselves to the examination, came up to the standard of our requirements, and were passed by the Board of Examiners. It seems not unreasonable to infer from these results that the Institute is already beginning to make itself felt by acting as a stimulus to chemical students in pursuing their studies. Of course, to accomplish this, was one of the aims and objects of the Institute, by setting up a fairly high standard of scientific and practical proficiency, and, I think, you will agree with me, that in the interests of professional chemists, the tendency should be to raise rather than relax this standard.

It is gratifying to find from the Treasurer's Report that the state of our finances is satisfactory, and that during the past year

there is an excess of income over expenditure of £371. Excluding Entrance Fees and Life Compositions, the total sum derived from the three sources of income, namely, annual subscriptions, fees on examination and interest on capital, amounts to £1,038, while the total expense during the year has reached £667. The state of the finances of the Institute must always be a subject of interest to us all, and have an important claim upon our consideration; and it is undoubtedly a matter of great satisfaction that, notwithstanding the heavy expense of obtaining our Charter, our capital now amounts to upwards of six thousand pounds. Without the accumulation of funds we should probably still be without our Charter, and without the requisite means at our command, we should more than likely fail in securing in the future some of the great aims and objects of our Association.

The Institute, it appears, has lost eleven Fellows by death during the past year. Among these losses I cannot help referring especially to the decease of Professor Carnelly at the comparatively early age of 38. He was a man of considerable promise, and had deservedly gained a high reputation as a scientific chemist, partly from the results of his labours in the field of organic research, and partly from the work which he did in developing the periodic system of Newlands and Mendeléeff.

In my first address two years ago I ventured to make the following observations:—"I believe it would tend greatly to "enhance the feeling of good-fellowship and give a stimulus to "scientific work, if an outlet were provided for what appears to "be a strong latent desire, which might be found to be very general, to bring before the whole body of Fellows, in some "public manner, questions of high scientific interest or public utility. It might be that in this way the Institute would attain a degree of visibility in a short time which it would otherwise take years to accomplish. I would not suggest that

"frequent meetings should be held; but that a yearly gathering of the members should be convened, lasting two or more days, according to the necessity of the case, when papers would be read and discussed, and appropriate reports of the same published in the form of 'Proceedings.'"

In consequence of the suggestion which I thus made, a Committee was appointed to consider the desirability of holding an Annual Meeting of the Fellows for the purpose of reading and discussing papers on various topics of interest to professional In the course of the deliberations of the Committee, it was thought by some of the Members that the Institute might be made to afford increased advantages to the Fellows by the holding of regular periodical Meetings, as some similar societies do, for reading and discussing analytical and other papers, and by the publication of the same in a monthly journal of Proceedings of the Institute. Regarding the form the question had assumed as of great importance, I took the opportunity of placing the matter in all its bearings before the Fellows in my address last year, and subsequently ascertained as far as practicable their views on the subject, with the result that opinion appeared to be much divided with regard to the propriety of the proposal.

The matter had been under the consideration of the Council for a considerable period, and every aspect of the question was carefully discussed; in the end the decision arrived at was practically that the interests of the Institute would be best served by adhering to the original lines of a qualifying and registering body. It was unanimously agreed, however, that it would be desirable to hold two sessional Meetings of the Members each year, at which subjects of interest to professional chemists could be brought forward for consideration and discussion in the form of papers or otherwise.

It is contemplated, if practicable, to arrange for the first of these Meetings in the month of May next, and it is hoped that Fellows will show their interest in and appreciation of the Institute by doing their utmost to make the first Meeting a success.

It will be in the recollection of the Fellows that in my address on the 1st March, 1889, I was able to announce that, after a long, patient, and exhaustive discussion of the question of the general training of candidates for the admission to the Practical Examination for the Associateship, the Council had unanimously agreed to a scheme which was afterwards issued in the form of a new Prospectus, by which every Candidate was required to produce evidence that "he has passed satisfactorily through a systematic course of "at least three years' study in the subjects of Theoretical and "Practical Chemistry, Physics, and Elementary Mathematics, in "any one or more of the Universities or chartered or incorporated "Colleges or Schools approved by the Council; or that he has "been engaged for four years in the practice of Chemistry in the "Laboratory of a Fellow of the Institute, during at least two years " of which time he has been entered as a Student of the Institute "and has regularly attended systematic courses of instruction in "the said subjects at such University, College or School."

In consequence of the alternative course of training provided herein, it became necessary for the Council last year to draw up and issue regulations for the admission to the Associateship of Students of the Institute who are engaged in the practice of Chemistry in the laboratory of a Fellow. The consideration of the subject raised afresh the vexed question of the exclusive training in practical Chemistry in the laboratories of Fellows, but the opinion of the majority of the Council was, that the requisite training could not be satisfactorily afforded and guaranteed in private laboratories, and that it was for the best interests of the Institute,

and of its present and prospective members, that a portion, at least, of the training in practical chemistry should be insisted upon at some recognized University, College, or School. The regulations finally adopted may be regarded as somewhat in the nature of a compromise, which will be seen from the fact that the systematic attendance for instruction in practical chemistry is limited to three days in each week, and not less than five hours each day during two academic years.

It is believed that this system of training, if rigidly carried out, and the instruction of the Student is reasonably attended to in the Laboratory of a Fellow, will prove adequate to maintain the standard of scientific and practical proficiency aimed at by the Institute for the elevation of "the profession of Consulting and Analytical Chemistry."

It is earnestly to be hoped that the regulations as now arranged and adopted, will be loyally accepted by all parties, as a final settlement of the question for the present. It cannot be impressed too strongly upon the minds of Fellows, that one of the fundamental objects of the Institute is to ensure that all persons becoming successively Associates and Fellows, shall have undergone a thoroughly efficient scientific training, and that if the Council adopted regulations which would not accomplish this end, they would be untrue to the principles upon which the Institute was founded. It must be admitted that practically we are not in a position, at present, to offer any exclusive rights in lieu of the sacrifice of individual interests, but you may rely upon it, that whether successful or unsuccessful in obtaining compulsory powers, the Fellowship of the Institute will become sooner or later a necessity to the Professional Chemist. With the daily growing importance of the profession of Analytical and Consulting Chemistry to the public, a guarantee that persons entering the chemical profession possess both a practical and scientific knowledge of their professional work, will become in time a necessity, and



PRESIDENT'S ADDRESS.

the Institute, which is endowed with anthority to grant certificates of competency, is the only body properly constituted to undertake such a function. It is both the right and the province of the Institute to take the initiative in this direction, and to watch for a suitable opportunity to endeavour to secure statutory compulsory powers for the registration of all practising analytical chemists, or their enrolment as Fellows of the Institute of Chemistry.

The Local Government Board, as you are probably aware, admits the Fellowship of the Institute as sufficient evidence of qualification as an Analytical Chemist, and leaves us to see that all qualified practising Analytical Chemists are Fellows, and this the Institute must sooner or later try and accomplish by the aid of Parliament.

In view of this, it is important that the Institute should maintain a high standard of scientific attainments, and an unimpeachable system of training, as, in the interest of the public. Parliament would look in this direction for guarantees for satisfactory professional qualifications.

There has been a growing feeling that the Institute has not taken proper steps to put itself in touch with the Fellows, and that it has largely neglected one of its functions to look after the personal interests of Professional Chemists. It is difficult to say how far the Institute has been at fault in this respect, but the Council has always shown the greatest desire to assist Fellows in cases where they could see their way to usefully interpose. It must be admitted that it should be the function of the Institute to lend its moral support to Fellows in maintaining their rights, and to advise and assist them in matters of difficulty. The Institute should also co-operate with Fellows in watching and scrutinising the different appointments of Public Analysts or Chemical Advisers made by County Councils, Corporations or

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PRESIDENT'S ADDRESS.

other public bodies to prevent as far as possible chemical posts being filled by unqualified men to the prejudice of properly qualified candidates.

The Council to give proof of its desire to assist the Fellows in every legitimate way, and to look after the interests of the chemical profession, has appointed a special Committee entitled "A Committee of State Chemistry," to deal with all matters of the kind above indicated, and it is to be hoped that their labours will be rewarded by beneficial results to the Fellows generally.

It is matter of regret that the attempt to establish a Benevolent Fund in connection with the Institute has proved unsuccessful. The result of the appeal to the Fellows and Associates on the subject was highly disappointing, and showed the absence of any desire on their part, at present, to assist in carrying out the project. Of the 781 Fellows and Associates to whom a circular was sent only 172 replied, and of these there were only 130 in favour of the formation of the proposed Fund. The project is one which should not be allowed to drop, for sooner or later the establishment of a Benevolent Fund in connection with the Institute must become a necessity, and the Council should not be disheartened at one or more failures in their appeal to the Members.

Although my tenure of office as your President is coming to an end with the close of these observations, my interest in the welfare and progress of the Institute will continue as earnest and intense in the future as it has been in the past. My term of office has not been without its difficulties and responsibilities, but my burden has been made comparatively easy by the kind and hearty good-will with which the successive Councils have assisted and loyally supported me, and I desire to thank one and all for their invaluable support, and for the considerate way in which they have always received my views, and regarded my efforts to promote the interests of the Institute.

I can look back with pleasing recollections upon many incidents in connection with my relations, both with the Council and with the members of the Institute generally, and I should be wanting in gratitude if I did not tender my hearty thanks to the latter for the indulgence and generous feeling which they have uniformly shown towards me.

With united effort and combined action, the continued success of the Institute is a certainty, and as a last word from this chair, I would implore all those who are engaged in the management of its affairs to sink all purely personal interests, and devote themselves thoroughly to the development and advancement of the Institute; and I am happy to know, that in the President who has been nominated you will have the advantage of a gentleman who possesses these feelings and sentiments in an eminent degree. Dr. Tilden's admirable qualities are well known to most of us as a colleague on the Council, and I feel sure he, as your President, will be animated by only one feeling, that is, an earnest desire to maintain the dignity of the Institute, and to promote its best interests.

OBITUARIES.

It will be seen from the Report of Council that the Institute has lost eleven Fellows during the past year. The names of the deceased Fellows are—H. B. Brady, T. Carnelly, John Collins, J. B. Hutcheson, E. Chambers Nicholson, T. R. Ogilvie, David Page, R. Romanis, Henry Smith, Alexander Y. Stewart, and Henry H. Walker. Short notices of some of these are appended.

HENRY BOWMAN BRADY, LL.D., F.R.S., F.C.S., F.G.S., F.Z.S., was born at Newcastle-on-Tyne, in 1835. After apprenticeship to a pharmaceutical chemist at Leeds, from 1855 to 1876 he carried on the business of manufacturing and pharmaceutical chemist in Newcastle. He was a Member of the Council, and one of the Examiners of the Pharmaceutical Society, and besides contributing important papers to the Pharmaceutical Journal, he was the originator of the Pharmaceutical Congress, and its President in 1872. On his retirement from active business life he conducted extensive biological researches, becoming the chief authority in this country on recent and fossil Foraminifera. His chief work was the Report on the Foraminifera, collected on the "Challenger" expedition in 1873-6. This report, covering 814 quarto pages, and illustrated by 115 plates, is the standard work of reference on the subject. Dr. Brady was a Fellow of many Scientific Societies both in England and abroad. He served as Member of the Council of the Royal Society, and in 1888 he received the honorary degree of LL.D. from the University of Aberdeen; in the same year the Emperor of Austria presented him with the Gold Medal for Arts and Sciences, the highest order that a scientific man can receive in that empire. Of late years Dr. Brady suffered from ill-health, which travel in all parts of the world failed to alleviate. His death occurred at Bournemouth on January 10th of this year.

THOMAS CARNELLY, D.Sc., F.C.S., was born in 1852. He received his education at University College, London, and was subsequently appointed Demonstrator and Assistant Lecturer at the Owens College, Manchester, where he was for some years. When Firth College, Sheffield, was founded, he became Professor of Chemistry there, and remained until his appointment to the chair of Chemistry at Dundee. On the death of Professor Brazier, at Aberdeen, he again moved, succeeding him in the Professorship at that University. He died suddenly on the 27th August, 1890.

Professor Carnelly had extended his investigations into many branches of Chemistry and the allied sciences. The records of organic and inorganic chemistry, chemical physics, and sanitary science, all bear evidence of his ingenuity and skill, but of late years he had devoted himself more especially to the developments of the periodic system of Newlands and Mendeléeff, and in furtherance of this object, had not only undertaken a most laborious work in compiling a list of the physical constants already published, but had materially added to this by his own investigations. He is a loss to the Institute and to the scientific world at large.

John B. Hutcheson, F.C.S., was born April 10th, 1848, at Dunoon, and received his education at the school of the village. He subsequently went to the laboratory of Thomas Anderson, then Professor of Chemistry at Glasgow University, and ultimately became one of his assistants. In 1869 he left the University and entered the Turkey-red works of Messrs. Inglis and Wakefield, near Glasgow, as their chemist. In 1871 he again returned to Professor Anderson as assistant, and when Mr. John Ferguson succeeded to the Professorship in 1874, Mr. Hutcheson was appointed one of the official assistants, remaining at the University until his death on April 15th, 1890. He left a wife and four children. He was a successful teacher and a good analyst.

EDWARD CHAMBERS NICHOLSON, F.C.S., whose greatest discoveries were coincident with the earlier stages of progress of the coal-tar colour industry, was born in January, 1827, at Lincoln, the seventh son of the late Robert Nicholson, of Lincoln and Maidenhead. Owing to the death of his mother in the following year, he was, during boyhood, placed under the care of his aunt, Miss Chambers, of South Carlton, Lincolnshire. When ten years of age, he was sent to Dr. Beesley's school at Uxbridge, and after completing his education there, was placed for a time with a

chemist and druggist at Andover, from whence he was transferred to the laboratory of Mr. Lloyd Bullock, in Conduit Street, London.

In October, 1845, young Nicholson entered as one of the first students the newly-opened laboratories of the Royal College of Chemistry, under Dr. A. W. Hofmann, having for contemporaries Messrs. Abel, Bloxam, De la Rue, Galloway, Rowney, and George Simpson. He was soon promoted to be an Assistant, and helped the Professor in some of his earliest researches. Later, in 1848, he published, conjointly with his friend F. A. Abel, an elaborate memoir on strychnine and its salts, by which the true constitution of this organic base was satisfactorily determined.

Mr. Nicholson remained at the College until 1850, when he accepted an engagement offered him by Messrs. Fothergill & Co., of Aberdare, to investigate the chemistry of iron making. Here he made numerous experiments, conjointly with Dr. David Price, on the products of the hot and cold blast and refinery furnaces, but was forced to give up the work by a bad attack of typhoid fever, which induced his return to London. Then, shortly afterwards, in 1853, when sufficiently recovered, he joined his friends, Messrs. Simpson and Maule, of Kennington Road, and helped to start the chemical factory at Lock's Fields, Walworth. Here he introduced improvements in the manufacture of pyrogallol, ether, collodion, &c., and the firm afterwards turned their attention to aniline and the coal-tar colours, which necessitated the building of a larger factory at Hackney Wick. During this period Mr. Nicholson discovered the arsenic acid process of manufacturing magenta, but found himself anticipated by eight days by Dr. Henry Medlock's patent of January 18th, 1860, which his firm afterwards purchased. The three large crowns of crystallised rosaniline acetate shown in the International Exhibition of 1862 excited

universal admiration; but the discovery of chrysaniline yellow, of the lower phenylated products of rosaniline, Alexandra violet, regina, &c., and the mode of rendering soluble the spirit dye known as Girard's blue by a process of sulphonation in two stages, giving either the pure soluble blue for silk, or Nicholson blue for wool, were amongst his greatest technical achievements. In August, 1868, Mr. Nicholson finally retired from his active chemical labours, but took a continued interest in the progress of scientific discovery. He was an original member of the Society of Chemical Industry, and a Fellow of the Chemical Society. On the 23rd October last he died of cancer, in the sixty-fourth year of his age, leaving his widow and a numerous circle of friends to mourn his loss.

DAVID PAGE, M.D., F.C.S., the eldest son of the late Dr. David Page, Professor of Geology in the College of Science. Newcastle-on-Tyne, was born in Edinburgh in the year 1846. He was at the University of Edinburgh from 1862 to 1864, working part of the time with Sir Lyon Playfair, the Professor of Chemistry there. On leaving, he went to the Gunpowder Mills of Messrs. Wakefield & Co., near Kendal for a time, and then re-entered the University and became one of the most distinguished medical students of his time, taking no fewer than 15 gold medals in various subjects. Shortly afterwards he was appointed Medical Officer of Health for the County of Westmoreland, and during his tenure of office he effected many beneficial sanitary reforms in the district. He next entered the Civil Service as one of the medical officers under the Local Government Board, Whitehall, and became Vaccination Inspector for the Northern Counties of England. In 1889 he was appointed the External Examiner in Medical Jurisprudence in the University of Edinburgh. He died of tumour on the brain on 20th February, 1890, leaving a widow and seven children.

Dr. Page was a man of great energy, his analytical work being executed not only with extreme care and accuracy, but very rapidly. He possessed considerable literary skill, and was at one time on the Staff of Abstractors of the Journal of the Chemical Society.

ROBERT ROMANIS, D.Sc., F.C.S., Chemical Examiner to the Burma Government and Professor at the Rangoon College, was born in 1854. He was educated first at Edinburgh University, where he took the degree of D.Sc., and subsequently in Germany. He was at one time on the teaching staff of Clifton College, but shortly afterwards went out to Burma, where he became Science Master at the Rangoon High School, subsequently the Rangoon College. He died suddenly of cholera in its most acute form. During the Burmese War he was on the Staff of General Prendergast, and made a special report on the resources of the recently acquired territory.

HENRY SMITH, M.D., Loudon, Barrister-at-Law. We have to record the death of Dr. Henry Smith at Paris, on Friday, the 20th June, 1890. He was born at Plumstead, in Kent, on the 15th November, 1857, and was, therefore, in his 33rd year. He was educated at the City of London School, and having decided to study medicine, entered at St. Bartholomew's Hospital, where, after obtaining the Wix and Bentley Prizes, he became L.S.A. in 1879, a M.R.C.S. in 1881, and in the same year took the M.B. degree of the University of London, and in 1885 the M.D. degree from the same University. During these years he filled some of the most important resident medical appointments in London, being successively house physician to the Hospital for Consumption, &c., Brompton, house physician to St. Bartholomew's Hospital, house surgeon, and subsequently, house physician to the Hospital for Sick Children, Great Ormond Street. During his residence at the

latter Hospital the first symptons of the disease manifested themselves, from which he ultimately died, and it is a matter of great regret to all that he did not at once take a long voyage, but his services had been so eminently successful in the afore-mentioned offices, and so warmly appreciated by all with whom he had been brought in contact, that he was reluctant to leave London and forego the advantages he had gained.

His attention was now specially directed to public health questions, and he took the Diploma in Public Health from the University of Cambridge, and was elected a Fellow of the Institute of Chemistry; he was appointed Public Analyst for Woolwich and for Plumstead, and deputy medical Officer of Health for the latter place. In 1887 he was called to the Bar at Lincoln's Inn.

Unfortunately the dread disease, consumption, from which he suffered slowly but surely made headway, and in 1888, having to seek a more congenial atmosphere than that found in London, he went first to Hastings, and in January, 1890, to Hyéres; he was on his way home, when he died in Paris, only reaching that city on the morning of his death.

Dr. Henry Smith was a man of much common sense, of keen perception and great ability, kind hearted and sympathetic, greatly beloved and greatly regretted by all who knew him, and who had every reason to believe his career would have been eminently successful.

His remains were brought to England and buried at the New Plumstead Cemetery, on Friday, the 27th June, 1890. His burial being the first in the Cemetery which his father, as Chairman of the Burial Board, had done so much to promote.



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INSTITUTE OF CHEMISTRY

OF

GREAT BRITAIN AND IRELAND.

PROCEDINGS.

PART III. 1891.

Zondon:

PRINTED BY A. P. BLUNDELL, TAYLOR & Co., 177, UPPER THAMES ST., E.C.





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1891.





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MEETINGS OF COUNCIL.

THE COUNCIL elected on the 2nd of March has held the usual meetings, with an average attendance of 19 at each meeting. Since the beginning of the year there have been 26 Committee Meetings, at which, besides routine business, important matters affecting the welfare of the Institute have been fully discussed.

"REGULATIONS"

FOR THE ADMISSION TO THE ASSOCIATESHIP OF
STUDENTS OF THE INSTITUTE

who are engaged in the practice of Chemistry in the Laboratory of a Fellow of the Institute.

In reference to the regulations for the admission to the Associateship of Students of the Institute who are engaged in the Practice of Chemistry in the laboratory of a Fellow of the Institute, it being the intention of the Council that no student shall be admitted to the Associateship without having passed through a course of continuous systematic study, they have resolved that no Course of Lectures or other forms of instruction in Chemistry or Physics be recognised as a part of the curriculum prescribed for candidates for the Associateship, unless given in the daytime by the Professor of the subject in one of the recognised in stitutions, or in the case of laboratory work, by duly appointed sistants acting under the supervision of the Professor; and the less at the same time sufficient evidence is afforded by the candidate that during the period of attendance upon such instruction, the whole of his time has been occupied in study or laboratory

practice, either in a recognised College, or, in the case of Students who are pupils of a Fellow of the Institute, partly in a recognised College and partly in the laboratory of such Fellow.

CONFERENCE.

In their last Annual Report, the Council informed the Members that two Sessional Meetings would be held during the year for the discussion of topics of interest to professional chemists. The first of these Meetings took place on May 12th and 13th, when four papers were read, namely:—

- "On the Relation of the Chemical Society to Professional Chemistry," by Dr. Odling, F.R.S.
- "The Analytical Chemist in Relation to the Public, the Profession, and the Institute," by Mr. Otto Hehner.
- "On the Training Requisite for Professional Chemists," by Dr. C. R. A. Wright, F.R.S.
- "The best Training for an Analytical Chemist," by Mr. F. T. Lloyd.

The reading of the several papers was followed by an animated discussion.

EXAMINATION IN PRACTICAL CHEMISTRY.

The Examination in Practical Chemistry, which was held on July 13th and following days, was conducted by the Board of Examiners, namely:—

Dr. W. W. J. Nicol	Birmingham.
Professor W. N. HARTLEY, F.R.S.	Dublin.
Dr. E. J. MILLS, F.R.S.	Glasgow.
Mr. T. FAIRLEY	Leeda

Mr. Watson Smith..... Manchester.

Examinations were held at five centres, namely, Birmingham, Dublin, Glasgow, Leeds, and London, and in accordance with the regulations relating to the production of note books, the candidates sent them, accompanied by the Professor's certificate that the work contained in them had been performed under his supervision, or that of his assistants. These, as a rule, were well kept, and a decided improvement on those presented last year.

The number of candidates who entered was 22, and they all presented themselves for Examination, namely, 15 at London, 3 at Birmingham, 2 at Leeds, 1 at Dublin, and 1 at Glasgow. Of these 20 passed the Examination in a satisfactory manner, and the following List contains their names, and that of the centres at which they were examined.

Mr. J. Burton	Leeds.
" H. T. BUTCHER	Birmingham.
"W. J. A. BUTTERFIELD	London.
" A. C. CARTER	London.
" A. J. Dixon	Glasgow.
" B. L. Dunne	Dublin.
" F. B. GRUNDY	London.
" J. Hendrick	London.
" D. Homfray	Leeds.
" N. LEONARD	London.
" W. Marshall	London.
" J. H. MILLAR	Birmingham.
" J. C. Quinn	London.
" P. A. E. RICHARDS	London.
" W. A. C. ROGERS	London.
" E. H. R. SALMON	London.
" J. E. SALTMARSH	London.
,, J. Wade	London.
" E. E. WATSON	London.
" T. M. WYATT	London.

The same exercises were set at all the centres. Those in Qualitative Analysis comprised—

- (1) An alloy containing copper, tin, and a small quantity of zinc.
- (2) A solution containing iron (ferric), cobalt, strontium, and nitric, phosphoric and hydrochloric acids.
- (3) The candidates were also required to prepare aniline oxalate, to determine the solubility of the oxalate in water at 20°, and to convert a portion of the oxalate into oxanilide.

In Quantitative Analysis the following exercises were set:-

- 1. Estimation of the amount of copper and iron in a sample of copper pyrites.
 - 2. One of the two following:—
 - (a) Estimation of the amount of "available oxygen" in a sample of pyrolusite.
 - (b) Determinations of the amount of calcium oxide (CaO) and of carbonic anhydride (CO₂) in a sample of calcium carbonate (Iceland Spar was used in fine powder).
- 3. To determine the amount of nitrogen in a mixture of urea and sugar, by burning it with soda lime.

An analysis of the work shows that the qualitative exercises this year have been done far better by the candidates than last year; more care being taken in the separations.

The quantitative work has been well done, with the exception of the combustion; this is to be accounted for to a great extent by the difficulty in burning the mixture of urea and sugar, too little time having been taken to burn it properly.

FELLOWS AND ASSOCIATES.

Since the Register went to press 23 Fellows and 20 Associates have been elected by the Council, and 17 Students have been admitted.

The names and addresses of those who have been formally admitted are as follows:—

FELLOWS.

Blount, Bertram, Chemical Laboratory and Testing Works, Broadway, Westminster, S.W.

Cameron, J. Macdonald, 5, Raymond Buildings, Gray's Inn, E.C. Collins, Sydney H., 13, Kyverdale Road, Stoke Newington.

Head, Casimir J., F.C.S., Elisenhutte, near Nassau, Germany.

Jones, H. G., 9, Ingham Road, West Hampstead, N.W.

Lowe, Clement Ward, Summerville House, Reddish, Stockport. Lumsden, Alexander A., Forth Chemical Works, Boness, Scotland.

Marriott, Thomas B., Passengem Mine, Ouro Preto, Brazil.

Pauls, C. A., B.Sc., Rivington Grammar School, near Bolton. Proctor, H. R., Yorkshire College, Leeds.

Shegog, Thomas A., Royal College of Science, Stephen's Green, Dublin.

Vasey, S. A., Charing Cross Hospital, W.C.

Weeks, Henry B., 13, Acacia Parade, Plumstead Common. White, John, 14, Temple Street, Birmingham.

ASSOCIATES.

Butcher, H. T., 36, Oakley Crescent, Chelsea, S.W.

Duncan, William, 10, Plough and Harrow Road, Edgbaston, Birmingham.

Dunne, B. L., 64, Lower Leeson Street, Dublin.

Leonard, Norman, Chemical Laboratory, Guy's Hospital, E.C.

Richards, P. A. E., Charing Cross Hospital, W.C.

Salmon, E. H. R., 70, Kenninghall Road, Lower Clapton, N.W.

STUDENTS.

Amer, Richard Q., 34, Isledon Road, Holloway, N.

Baker, Julian L. Stamford, Headham Road, Upper Tooting, S.W.

Bawden, W. J., 30, St. Georges Road, Ladbroke Grove, Notting Hill, S.W.

Bayley, F. S., 3, Blackheath Rise, Lewisham, S.E.

Bult, H. J., 12, Chantry Road, Brixton, S.W.

Caines, C. M., 7, Rochester Terrace, Camden Road, N.

Evans, R. C. T., 24, Tavistock Road, Westbourne Park, W.

Forster, Ferdinand E., Laboratory, Bridge Chambers, Burton-on-Trent.

Forster, M. O., 32, Binfield Road, Clapham Road, S.W.

Green, F. D., Glengall, Wanstead, E.

Kerr, James, 58, Pilrig Street, Edinburgh.

Listmain, George P., Herrington Hall, Fence Houses, Durham.

Marshall, R. T., 25, Lancaster Road, Richmond.

Priest, M., The Home Office, Whitehall, W.

Shaw, G. E., Messrs. Howard & Sons, Stratford, E.

Tetlow, W. E., Ash Cottage, Ashfield, Dumblane.

Youle, W. E., 30, Furnival Street, Holborn, E.C.









INSTITUTE OF CHEMISTRY

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GREAT BRITAIN AND IRELAND

PROCEEDINGS.

PART I. 1892.

Annual General Meeting.

Address of the President,
Dr. W. A. TILDEN, F.R.S.







INSTITUTE OF CHEMISTRY

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Dr. W. A. TILDEN, F.R.S.



PROCEEDINGS

OF THE

INSTITUTE OF CHEMISTRY

OF

GREAT BRITAIN AND IRELAND.

PART I. 1892.

REPORT OF THE ANNUAL GENERAL MEETING,

BALANCE SHEET FOR 1891,

AND

ADDRESS OF THE PRESIDENT,

Dr. W. A. TILDEN, F.R.S., &c.

ISSUED BY AUTHORITY OF THE COUNCIL,

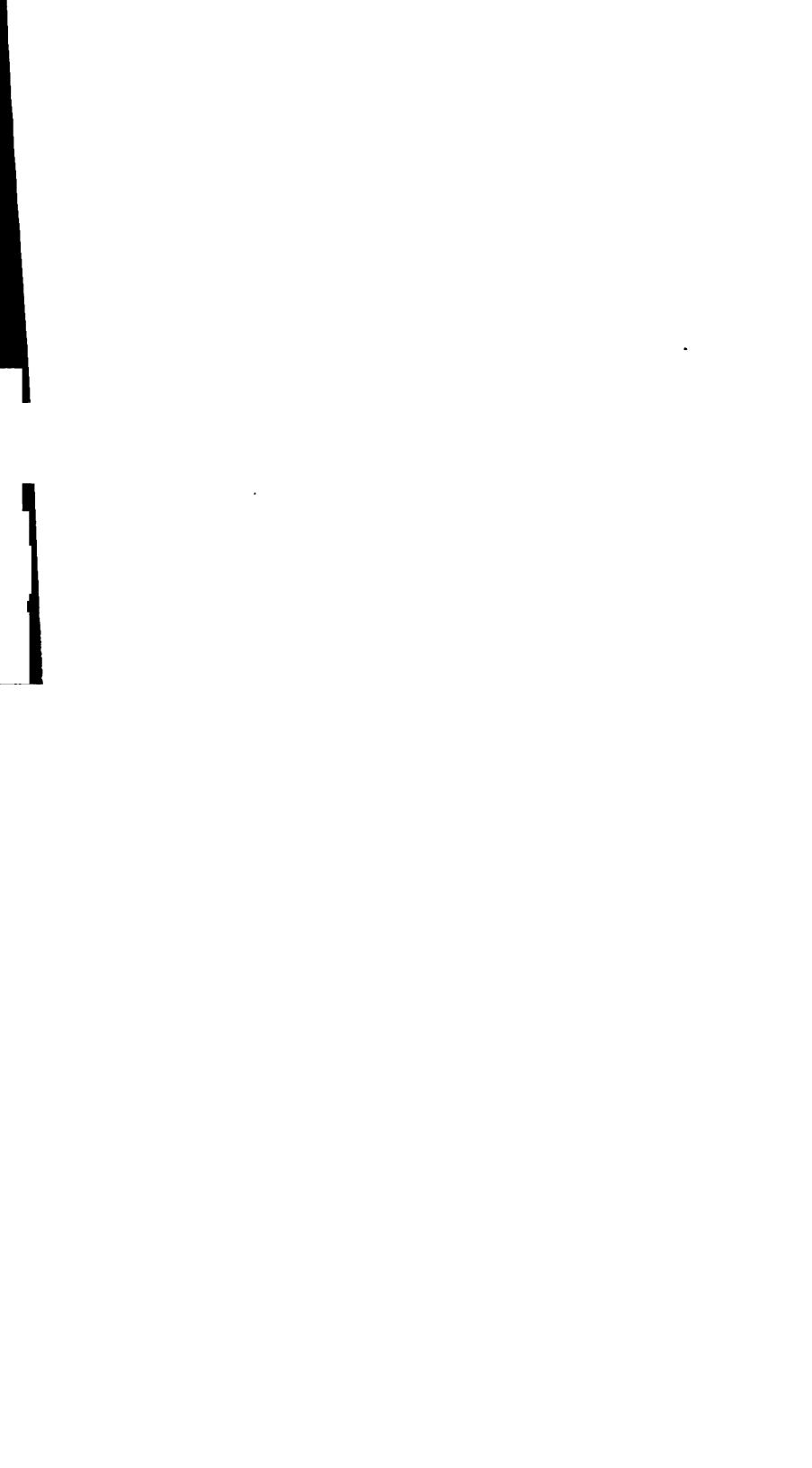
UNDER THE SUPERVISION OF THE "PROCEEDINGS"

COMMITTEE.

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LIST OF OFFICERS AND COUNCIL FOR 1892.

PRESIDENT.

W. A. TILDEN, D.Sc., F.R.S., &c.

VICE-PRESIDENTS.

J. BELL, C.B., Ph.D., D.Sc., F.R.S., &c.

M. CARTEIGHE, F.C.S.

E. FRANKLAND, D.C.L., F.R.S., &c.

CHARLES E. GROVES, F.R.S,

W. RAMSAY, Ph.D., F.R.S., &c.

J. EMERSON REYNOLDS, M.D., F.R.S.

TREASURER.

DAVID HOWARD, F.C.S.

ORDINARY MEMBERS OF COUNCIL.

- M. A. ADAMS, F.C.S.
- A. H. ALLEN, F.C.S.
- F. CLOWES, D.Sc., F.C.S
- A. DUPRÉ, Ph.D., F.R.S., &c.
- R. J. FRISWELL, F.C.S.
- A. J. GREENAWAY, F.C.S.
- O. HEHNER, F.C.S.
- H. J. HELM, F.C.S.
- D. B. HEWITT, M.D., F.C.S.
- J. F. HODGES, M.D., F.C.S.
- J. HUGHES, F.C.S.
- E. KINCH, F.C.S.
- G. H. MAKINS, F.C.S.
- R. MELDOLA, F.C.S.

- H. F. MORLEY, M.A., D.Sc., F.C.S.
- C. O'SULLIVAN, F.C.S.
- F. J. M. PAGE, B.Sc., F.C.S.
- R. T. PLIMPTON, Ph.D., F.C.S.
- A. SMITHELLS, B.Sc., F.C.S.
- J. C. STEVENSON, M.P., F.C.S.
- F. L. TEED, D.Sc., F.C.S.
- J. MILLAR THOMPSON, F.C.S.
- W. THORP, B.Sc., F.C.S.
- T. E. THORPE, Ph.D., F.R.S., &c.
- T. TYRER, F.C.S.
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J. BELL, C. E. CASSAL, E. FRANKLAND, T. E. THORPE.

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G. H. ROBERTSON.

OFFICES OF THE INSTITUTE.

9, ADELPHI TERRACE, STRAND, W.C.

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REPORT

OF

ANNUAL GENERAL MEETING

THE SIXTH ANNUAL GENERAL MEETING of the Institute of Chemistry of Great Britain and Ireland, incorporated by Royal Charter, was held at Burlington House, on Tuesday, the 1st March, 1892.

The Balance Shert (see p. 14) having been laid before the Meeting by the Treasurer, if was received and adopted.

The President then delivered his Address (see p. 15), and at its conclusion introduced the new Secretary, Mr. G. H. Robertson.

The REPORT OF THE COUNCIL, which was taken as read, is as follows:—

At the Annual General Meeting held last year there were 691 Fellows, 123 Associates, and 14 Students on the Register. Since then 19 Associates and 26 Fellows have been admitted, 20 of the latter having been raised from the Associateship, whilst 2 Fellows have resigned; 21 Students have also been admitted, and 1 has resigned. The names of 3 Fellows have been removed from the Register for non-payment of subscriptions, &c., and we have to lament the decease of 6 of our Members, namely: 5 Fellows—Dr. A. J. Bernays, Mr. C. Heisch, Dr. W. C. Henry, Mr. T. Hyde Hills, Mr. Edwin Richards, and 1 Associate—Mr. J. T. Blomfield. The names

on the Register therefore are now 705 Fellows and 121 Associates; a total increase of 18 Members during the past year. In addition there are 34 Students on the Register.

- Examinations were held at five centres in July last, namely, Birmingham, Dublin, Glasgow, Leeds, and London, at which 22 Candidates presented themselves; of these 20 passed, and were subsequently elected Members of the Institute.
- The Board of Examiners report that the qualitative work as a whole was far better done than it was at the examination held in 1890, and that the quantitative work was, as a rule, well done.
- Several important events have occurred in the course of the past Session.
- In accordance with the decision referred to in last year's Report, that two Conferences or Meetings should be held annually for the discussion of topics of interest to professional chemists, conferences were held on May 12th and 13th, and on the 22nd December. At the former, which were held in the day time, four papers were read, namely—
- "On the Relation of the Chemical Society to Professional Chemistry," by Dr. Odling, F.R.S.
- "The Analytical Chemist in Relation to the Public, the Profession, and the Institute," by Mr. Otto Hehner.
- "On the Training Requisite for Professional Chemists," by Dr. C. R. A. Wright, F.R.S.
- "The Best Training for an Analytical Chemist," by Mr. F. J. Lloyd.
- The reading of the several papers was followed by an animated discussion.

At the December Meeting, which was held in the evening, the subject for discussion was—

"The Ethics of Professional Certificates."

After introductory addresses by the President, Dr. Frankland, Mr. Carteighe, and Mr. Cassal, the discussion became general.

Notwithstanding the unfavourable condition of weather, the attendance at the Evening Conference in December was larger than the attendance at the Morning Conference in May. It is obviously not possible to select a time that would be equally convenient to everyone, but every endeavour will be made to suit the wishes of Fellows when these can be ascertained.

These two Conferences must be regarded as tentative in their character, and neither the papers read nor the discussion which followed have been published. In any future Conference of the kind which may be held, it will probably be advisable to report the proceedings for circulation amongst the Fellows.

The conditions under which Students, Associates and Fellows should be admitted to the Institute have again occupied the serious consideration of the Council. It was felt that no attempt further to alter the scheme at present in force would lead to a satisfactory result. Nothing but complete reconstruction would provide a scheme in which administrative difficulties would be reduced to a minimum, and a standard maintained which would be creditable to the Institute. In working out the details of the new system of regulations, however, unforeseen difficulties have arisen, which have delayed the completion of the plan. It is hoped that these difficulties, which arise out of the conditions imposed by the Charter, may be ultimately surmounted.

- In the case of two nominations for the office of Public Analyst early last year, representations were made by the Council of the Institute to the Local Government Board, that the gentlemen nominated were not Fellows of the Institute, and had not the qualifications necessary for properly filling the post of Public Analyst. The Local Government Board at first refused to confirm the nominations, but subsequently did confirm them.
- On the 29th May copies of the following resolutions of Council were sent to the Local Government Board:—
- 1. "That the attention of the Local Government Board should, in the interest of the public, be drawn to the importance of selecting for the office of Public Analyst only such persons as can give evidence of possessing sufficient chemical and microscopical knowledge; and that in order to secure these qualifications, it is desirable that those Candidates only should be eligible for the appointments who can show that they are Fellows of the Institute of Chemistry of Great Britain and Ireland, and that they have obtained practical experience of the analysis of food and drugs in the laboratory of a Public Analyst, or other chemist of established repute engaged in the analysis of food and drugs."
- 2. "That in the opinion of this Council the appointment of the same person to the offices of Medical Officer of Health, Public Analyst and Gas Examiner, as in the case of the recent appointments by the Chelsea Vestry, is extremely undesirable and opposed to the public good."
- These communications were acknowledged by the Secretary to the Board.

- Mr. Charles E. Groves, who has been Secretary since the Institute was first incorporated in 1877, has retired from the office of Registrar and Secretary. The Council take this opportunity of expressing their high appreciation of his long and valuable services, and of the conscientious, careful, and courteous manner in which all his official duties have been discharged.
- The appointment to the vacant offices will be filled up on March 1st, and the result announced at the Annual Meeting.
- The Council also has again to congratulate the Members on the present satisfactory financial position of the Institute.
- The Institute is indebted to the President and Council of the Chemical Society for the use of their rooms during the past year.
- The Report of the Council having been received and adopted, a resolution was passed on by Mr. Hehner's motion, that it be an instruction to the Council to submit the scheme or schemes for admission of candidates to Membership to an early General Meeting of the Members.
- The election of the Officers and Council for the ensuing year was then proceeded with, Messrs. W. Thompson and W. P. Wynne acting as Scrutineers, and Dr. Lawson and Mr. E. G. Hooper as Assistants.
- While the election of Council was in progress, that of the four Censors was proceeded with, and Dr. James Bell, Mr. C. E. Cassal, Dr. E. Frankland, and Professor T. E. Thorpe were duly elected. Messrs. B. H. Brough, E. R. Budden, and J. Holmes were appointed Auditors.

On the return of the Scrutineers, Mr. W. Thompson reported that, acting under the direction of Mr. Groves, only the voting lists of those Members who had paid their Annual Subscriptions for the current year had been counted, and appealed to the President to know if the direction was correct. The Meeting was therefore adjourned till 5 p.m. on Friday, 11th March, in order that the validity of the Voting Lists in question might be ascertained. At the adjourned Meeting Mr. Bernard Dyer replaced Mr. E. G. Hooper, who was unable to attend, as Assistant Scrutineer, and the counting of the voting lists was continued, the disputed balloting lists being accepted under the advice of Counsel. For the List of Officers and Council elected see p. 5.*

Of these we have to regret the loss of Mr. G. H. Makins, who has since died.

NSTITUTE OF CHEMISTRY OF GREAT BRITAIN AND IRELAND.

INCORPORATED BY ROYAL CHARTER.

STATEMENT OF ACCOUNT AND BALANCE SHEET,

FROM THE 18T JANUARY TO SIST DECEMBER, 1891.

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FRED. J. LAOYD.

Jan. 20th, 1892.

Andited and found correct,

THE PRESIDENT'S ADDRESS.

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T CANNOT commence the address, which by custom is expected from the President, without an expression of regret at the losses which the Institute has sustained by the death of six of our Members. Among the names which will thus drop out of the Register, those of Mr. Heisch and Dr. Henry remind us of times long antecedent to the foundation of the Institute. Mr. Heisch was one of the founders of the Chemical Society which first met in 1841, and Dr. Henry was, I find, elected a Fellow of the Royal Society in 1834. There are probably a few, at least, in this room who recall the genial presence of my old and valued friend Thomas Hyde Hills, who though never a professional chemist, was a generous friend of many a young chemist, analytical as well as pharmaceutical, of my earlier days. Bernays has been among us so recently, and as a judicious, sensible, and moderate Member of Council known and respected by all parties, that his disappearance from among us was an occasion of deep regret on all sides.

The Institute during the past year has made some advance, less in numerical strength than, as I believe, in influence and importance. But much, I think, remains yet to be done, not merely to make the Institute better known and membership of the Institute of greater direct utility to the Fellows, but to justify the possession of the Charter, and to give in return for the prestige conferred by the Charter a stronger guarantee of professional competence and professional morality. So that not only do

we need an agreement among the Fellows as to the course of training which should be imposed upon candidates for admission to our ranks, but unanimity of opinion and of practice in regard to all matters which concern our conduct as professional men.

As a provincial, cut off by distance from the advantages of frequent consultation with my professional friends, and after an absence of some years from the Council, I felt considerable surprise at being selected to fill the honorable position of President of such a body, composed as it is of elements so diverse. I desire again to express to the Fellows my acknowledgment of the distinction thus conferred upon me. Distinctions of this kind however, carry with them a burden of responsibility which rather severely taxes the energy and judgment of the recipient, and if I have failed in any respect to fulfil the expectations that may have been formed, I trust that some indulgence may be extended to me.

Perhaps it was too much to expect, that after the lapse of several years, I should return to the Council to find that the old differences upon questions of policy had disappeared. In a body of this kind, representing various interests, and necessarily looking at every question from different points of view, and recognising very different ethical standards, some division of parties is to be expected. I confess I have been disappointed at finding that there are members of the Institute who go so far as practically to declare that union is not strength, that it would promote the usefulness and enlarge the influence of the Institute, if a complete division of the British chemical world could be effected into two classes having separate interests, separate pursuits, and independent professional rank; that one of these classes should never engage in the pursuits of the other, and that membership of the Institute of Chemistry, with all that that implies, whether of privilege or of responsibility, should be reserved for one of these. classes, and that the other should not presume even to express an opinion upon affairs which, it is alleged, do not concern them. In plain English it has been said that the Institute was created for the analytical and consulting chemist, and for him alone; that all the Government and other officials, all the teachers and the industrial chemists and manufacturers, notwithstanding the fact that many of them are unavoidably also consulting chemists, should be suffered to take no part in the conduct of its affairs. This extreme view, if it could be carried into effect, would reduce the Institute to probably one-fifth of its present dimensions in point of numbers, and would practically annihilate its influence and prestige. Alike as a matter of justice and of policy, however, no such division would be possible. How impracticable it would be is shown by the fact that among the Fellows who form what may be called the exclusive party some are themselves teachers, others manufacturers, others more medical than chemical experts. might fairly ask whether these gentlemen are prepared to abandon their employment as teachers, merchants, or manufacturers, or other engagements, in favour of a purely analytical practice.

It seems to me incredible that it should not be obvious that the only sure source of strength and stability is the incorporation of all members of the profession which seeks to make a living out of chemistry, provided that they possess the requisite qualifications of sound knowledge and sufficient skill in their several departments. Further to show how impossible it would be to carry into effect such a system of exclusion, it is only necessary to point to the cases quite familiar to all of us of very eminent toxicologists or consulting experts, who are or have been at the same time distinguished teachers, and again to the professors in the Universities and Colleges who are in a similar position. The professors do as a matter of fact enjoy, and as a rule deservedly enjoy, the confidence of the public, and they are constantly liable to be called upon to act, and some of them frequently do act, as advisers in connection

with matters of public importance, and thus become, at any rate pro tem consulting chemists. No agitation, either within or without the Institute, is likely to induce the Government or municipal Corporations, or the public to abandon these sources of advice and assistance when occasion arises, and even in the contingency, at present remote, of the Institute obtaining exclusive powers, it is not persons of this class who would or could be debarred from this kind of practice by Parliament. I will also venture to ask what prospect there would have been at the present time of a Royal Charter, without the influence and efforts exercised in that behalf by a few distinguished men, chiefly of the professorial class, the influence of whom within the Institute it is now sought to minimise. The professors of chemistry, as a body, hold an unassailable professional position; their character and income are alike independent of connection with the Institute, and they derive less direct advantage from the existence of the Institute than any other class of its members. If the objections expressed by some of the rank and file to the importance which is attached to the opinions upon technical questions of such men as Professors Frankland, Odling, and Dewar (to whom I now tender my apologies) is based upon the discovery that they cannot command fees calculated upon the same scale, that is a matter in which no reconstruction of the Institute would help them. Such men as those I have named would stand in an eminent position whether professors or not, whether members of the Institute or not. But if, as the result of any ill-advised attempts to transfer the conduct of affairs from the hands of the more eminent to those of the less eninent members, the Institute be deprived of the countenance and co-operation of the professors in the Universities and Colleges throughout the country, so much the worse for the Institute and for the professional position of the entire body of members. social rank of any profession depends far more upon the public estimation in which those who are at the head are held than upon the average position of the members collectively.

I am therefore most anxious to impress upon the members the importance of proceeding in the direction of reforms in the constitution of the Council, as in all other matters, very deliberately and very thoughtfully. Manifestations of hasty feeling cannot be too strongly deprecated.

The training desirable for the young professional chemist is another question concerning which there is still some difference of There are still people who pretend to think that it is possible to make a chemist without teaching him chemistry, who seem to affirm that the repetition of a small number of operations in qualitative or quantitative analysis, without a systematic and graduated course of instruction in the philosophy of the science, and in allied branches of physics, is sufficient to qualify a man for the discharge of the duties which fall to the lot of a consulting chemist, duties in which the possession, not merely of a knowledge of facts, but of trained powers of observation and a cultivated judgment is indispensable for the formation of opinion the expression of which may involve very serious consequences to the client. other professions we see the system of apprenticeship or private pupilage either practically abandoned, as in the medical profession. or in process of modification, as among the lawyers and engineers. But, even if we had not the example of other professions, we need only consider a few facts to perceive the soundness of the principle now repeatedly affirmed by an overwhelming majority in successive councils of requiring a specified course of study, in a properly equipped collegiate institution, as the basis of the training to be undergone by all our Associates before admission. In the British Universities, almost without exception, and in the University Colleges of the new type, we find spacious laboratories provided with appliances and apparatus carefully prepared at a vast expense for the purposes of teaching. The teachers, as a rule, are men who have themselves passed through a long and severe course of study and training preparatory to the work to which they

devote practically the whole of their time and thought. these institutions everything proceeds under public observation, and they are practically open to inspection by all comers. seems idle to contend, as some appear to do, that every Fellow of this Institute is in a position to offer instruction in chemistry comparable in efficiency with that which is offered by the Universities and Colleges recognised by the Institute. I know that there are many private laboratories which are most admirably equipped and are conducted by chemists of acknowledged ability, but the equipment of such laboratories is not designed for the purpose of teaching, and the principal, whose practice is worthy of the name, has other uses for his time. On the other hand I have known of miserable little dens, miscalled laboratories, where the proprietor is glad to get water for analysis at 7s. 6d., and carbons in steel at 9d. a sample. Will it be maintained that the pupil is likely to learn as much of chemistry at either of these laboratories as in a College properly designed and furnished?

I am inclined to believe that the list of places of instruction to be recognised by the Institute will probably hereafter be extended, and it may come to pass that this augmented list will include some private laboratories. I see no objection to that, provided guarantees necessary for the protection of the pupils and for maintaining the character of the Institute are forthcoming. These guarantees will necessarily partake of the character of those which are afforded by all the public institutions now upon the list, and, in my opinion, the Council will never be justified in recognising as a properly qualified place of instruction any laboratory which is not prepared to fulfil such conditions as the following:—First there must be a definite programme or syllabus of instruction to be given by properly qualified teachers; secondly, there must be evidence of proper equipment in the form of space, apparatus and material; and thirdly, every one of the recognised places must be as freely open to inspection as are the institutions which at present

find a place on the list. But, under any circumstances, can we reasonably look forward to a time when every Fellow of the Institute will be qualified to teach scientific chemistry? I say scientific chemistry advisedly, because, however restricted and technical may be the practice in which the chemist, when qualified, expects to be engaged, he will never make a competent professional man without a sound scientific education. The principles of the science having been duly mastered, I am quite ready to express respectful admiration of the ingenuity displayed in the little tricks and dodges which often constitute factors so important in successful I am even prepared to go further and admit analytical processes. that there are many things connected with technical and analytical chemistry which can only be learnt properly in a properly organised technical laboratory. But to maintain that processes should be learnt first and that principles may be allowed to take care of themselves is about as true as that to learn bricklaying is sufficient to make an architect.

I cannot pass from this subject without referring to a fact which, in another place, I have already alluded to with regret. The profession of chemistry does not at present attract a fair proportion of the educated class of young men who flock into the other professions of law or medicine. The general education of the aspirants to our associateship is too often seriously defective, and I believe that this is more frequently a source of discredit to the profession of the analytical chemist than actual lack of technical knowledge. I am very anxious to see this remedied, and I have long been of opinion that young men should not be admitted without giving substantial evidence of possessing a fair English education. This is the basis of one provision in the new scheme of Examinations referred to in the Report of the Council, and I trust that, in the course of the ensuing year, the scheme may be brought into harmony with the provisious of the Charter.

During the past year, as you are aware, two meetings have been held in accordance with the proposition of my predecessor in this Chair. I hope they will be continued. I think conferences for the discussion of matters affecting the profession are likely to be useful. They help to clear the air, and after the experience of the two which have been held by way of experiment, we may know better what to do in future. With regard to the days and hours of meeting, I can only say that the Council were careful to consider how best to suit the convenience of the majority; and to those who complained so bitterly about the selection of an evening towards the end of December, it will be sufficient to say that the attendance, spite of the dense fog then prevailing, was about twice as large as at the meeting in May, concerning which no complaints reached me. The question of publication of reports of these meetings is even more difficult. There are many who think that a report of the papers and discussion should have been printed for circulation among the Fellows, and I strongly incline to this view myself. At the same time I sympathise most heartily with the objections which the majority of the Council felt to the publication of proceedings, which were not calculated upon the whole to command the respect of the world outside, upon whose favour, after all, the Institute is largely dependent. And I will venture to quote from the Charter a passage which, I fear, is sometimes overlooked. It runs thus-"The said Institute was not established for the purposes of gain, nor do the members thereof derive or seek any pecuniary profits from their membership, but the Society aims at the elevation of the profession of consulting and analytical chemistry, and the promotion of the efficiency and usefulness of persons practising the same, by compelling the observance of strict rules of membership, and by setting up a high standard of scientific and practical proficiency." I take this to mean that a Royal Charter is not to be turned to the narrow uses of a trades union.

The subject of discussion at the December meeting was "The Ethics of Professional Certificates," and I cannot help thinking that the majority of those who were present at that meeting would be in favour of a censorship to be exercised by the Institute over the issue of such certificates when given for the purposes of advertisement. I think it was a gratifying indication of the general feeling of the assembled members that there was not one who had a word to say in defence of the testimonials which some chemists are not ashamed to issue. I think this is a subject which might well occupy the attention of the Council, but no enactment concerning this or any other subject is likely to be operative without a more cordial loyalty on the part of the grumbling minority towards the executive body. The Council, I can assure you, works very hard. The report which is issued bears within itself evidence of this, but after all it is only an imperfect measure of the labour which has been expended.

It is sometimes said that the Institute has failed to confer those benefits upon the profession which were expected. I deny that the Institute has failed to assist the Fellows in all that could be reasonably expected. For those, if there are any, who suppose that it would be possible to provide them with clients and compel those clients to pay more liberal fees, I fear there is little satisfaction present or prospective, but in the direction of securing recognition for the Fellowship of the Institute, efforts have been made, successfully so far as the power of the Council goes. The Fellows could themselves do something more to emphasize the significance of the letters F.I.C., if they chose. I have, for my own part, discontinued the use of the letters F.C.S., and I believe, that if the Fellows of this Institute would agree with one accord to abandon them, the public would learn in a very short time what is the truth, namely, that they represent merely subscription to a club, which is pretty easy of access. On the other hand the letters to which our

Fellows alone are entitled, represent a professional stamp, which in the future, should be obtainable only after protracted training and searching examination. By writing these two side by side, as so many do, they lead their clients to infer quite naturally, that they are of about equal importance.

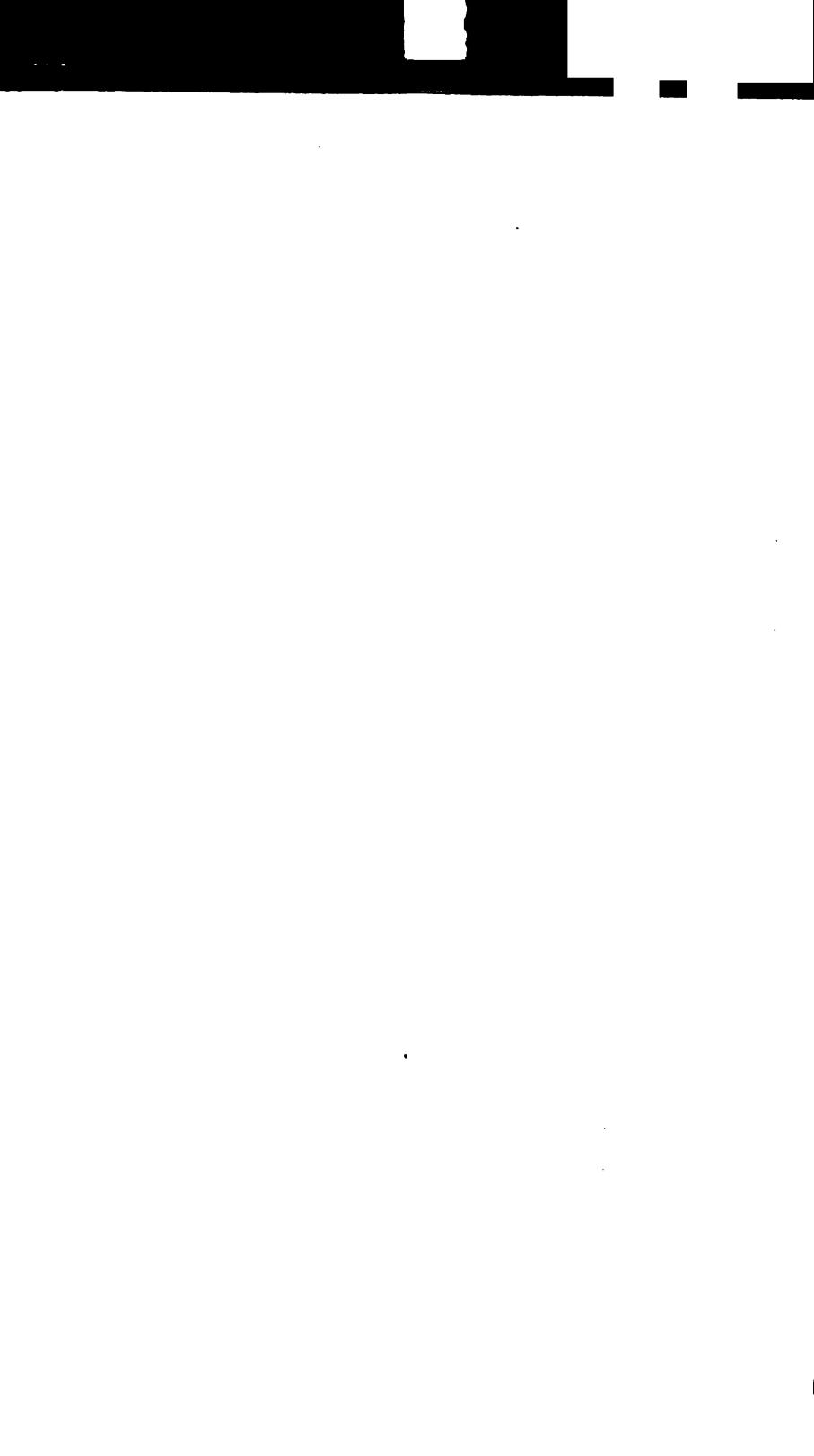
It is customary for Presidential addresses to be soothing and congratulatory. If I have unavoidably brought forward harsh topics of discord and especially if I have seemed to be preaching a sermon, it is because the circumstances of the time seemed to require it. I trust I shall be credited with a sincere desire to promote the prosperity of the Institute and all which tends legitimately to the advantage of the Fellows.



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INSTITUTE OF CHEMISTRY

OF

GREAT BRITAIN AND IRELAND.

PROCEEDINGS.

PART II. 1892.

Meetings of the Council;
Report of the Examiners;
Supplement to the Register, &c.

October, 1892.

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INSTITUTE OF CHEMISTRY

or

GREAT BRITAIN AND IRELAND.

PROCEEDINGS.

PART II. 1892.

Issued under the supervision of the "Proceedings
Committee."

October 29th, 1892.

PROCEEDINGS COMMITTEE.

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M. CARTEIGHE, F.C.S. F. J. M. PAGE, B.Sc.

DAVID HOWARD, F.C.S. W. RAMSAY, Ph.D., F R.S.

F. L. TEED, D.Sc., F.C.S.

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MEETINGS OF COUNCIL.

THE COUNCIL elected on the 1st day of March, has held six meetings, with an average attendance of 17 at each meeting. Since the beginning of the year, there have been 16 Committee Meetings, at which, besides routine business, important matters affecting the welfare of the Institute have been fully discussed.

The following letter, in reference to the use of Stills, has been received in answer to a memorandum drawn up by Mr. Carteighe, Vice-President, who has had an interview with the Officials of the Excise, in accordance with the request of the Council of the Institute:—

Dear Sir,

Having laid before the Board of Inland Revenue your letter of 28th July, I am directed, in reply, to acquaint you for the information of the Council of the Institute of Chemistry, that the Board have no desire to extend the obligation to take out a licence to Analytical Chemists using Stills, solely for purposes of distilling water. If an Analytical Chemist called upon to take out a licence by one of the Board's Officers will submit his case to the Board, they will be prepared to give it careful consideration.

I am, Sir,

Your obedient Servant,

(Signed), W. B. HEBERDEN,

M. CARTEIGHE, Esq.

Asst. Secretary.

CONFERENCE.

A Conference was held at the rooms of the Chemical Society, Burlington House, on Monday, May 16th. The subject for discussion, was:—

"The present regulations with respect to the admission of Fellows and Associates."

Thirty-six members were present. A full official report of the proceedings was forwarded to all Members of the Institute.

APPOINTMENT OF PUBLIC ANALYSTS.

A letter has been addressed by the President to the President of the Local Government Board drawing attention to the disadvantage which arises from the appointment of the same person to the Offices of Medical Officer of Health and Public Analyst jointly, and also pointing out the nature of the qualifications which should be possessed by all candidates for the office of Public Analyst. Vice-President Dr. Bell and the Registrar had an interview with the permanent Secretary of the Board, and it is hoped that in future, the evidence of competency submitted by persons chosen for appointments by County Councils and other bodies will be more strictly investigated.

EXTRAORDINARY GENERAL MEETING.

An Extraordinary General Meeting of the Members of the Institute, was held at the rooms of the Royal Statistical Society, 9, Adelphi Terrace, Strand, on Friday, the 7th day of October. 1892, to consider the Report of the Finance and Office Committees.

The President explained, that in view of the increasing business of the Office, the Council has long recognised the necessity for larger and more convenient rooms than those at present in the occupation of the Institute. The Office Committee was accordingly empowered in April last to look out for premises suitable for this purpose. The Council had, however, since the n found themselves again face to face with the difficulty of obtaining in London the use of a laboratory, where the practical Examinations of the Institute could be held, and they were impressed with the unsatisfactory position of the Institute so long as it was dependent upon the good will of individuals or of other institutions for the means of carrying on this most important function. They determined, therefore, that it would be advisable to obtain, if possible, a lease of premises upon which could be found, not only accommodation for the ordinary business of the office, but for all the business of the Institute. They had such premises in view, and they hoped by suitable alterations to provide a properly equipped laboratory, as well as rooms in which the Meetings of the Institute could be held. Such a plan, however, involves an outlay of capital, and they were advised that the Charter (Section 9, page 16) requires for this purpose the approval of a General Meeting of the Members of the Institute convened with notice of the object. Hence the summoning of this Meeting, which would be asked to give to the President and Council the necessary powers.

A letter was received from the Treasurer stating the financial position of the Institute.

A letter from Mr. William Thomson, of Manchester, was read by the President, in which it was suggested that a subscription should be opened among the members of the Institute, to raise funds for the purpose of acquiring a site for the erection of a building, which should provide accommodation for offices

and a laboratory, or as an alternative, that the amount might be raised by shares, bearing a nominal rate of interest, issued to members. After some discussion the following resolution was passed, nem. con.:—

"That in view of the necessity for providing in addition to office accommodation, premises upon which the Examinations of the Institute can be efficiently conducted, the Council be empowered to take steps to secure such premises, and, if necessary, to expend upon the purchase of a lease, or buildings, a sum not exceeding one fourth of the invested capital of the Institute, and that the President be authorised to sign the necessary documents."

REPORT OF THE EXAMINERS

PROFESSOR WYNDHAM R. DUNSTAN, M.A.

AND

THOMAS FAIRLEY, Esq., F.R.S.E.

The Examiners have to report that the Examination in Practical Chemistry for the Associateship was held in the Laboratory of the Finsbury Technical College, and extended over five days, commencing on Monday, July 11, at 9 a.m., and concluding on Friday, July 15th, at 4 p.m. There were 37 candidates, for whom it was just possible to find room in the Laboratory. Several days previous to the Examination were spent in adapting and furnishing the Laboratory, which is principally employed for teaching elementary students, for the purposes of an advanced Examination in the several departments of Practical Chemistry.

Every effort was made to provide the candidates with proper facilities for carrying on their experimental work, and it is believed that on the whole serious inconvenience was successfully avoided. The Examiners wish, however, to direct the attention of the Council to the large amount of additional labour and responsibility which is thrown upon them, as well as to the greater or less inconvenience inevitably experienced by the candidates when the Examination is held in a Laboratory which is not fully provided with the necessary appliances. On the present occasion balances, drying ovens, combustion furnaces, and indeed all the important apparatus had to be purchased or borrowed.

It would be far more satisfactory if the Institute possessed a small, well-furnished laboratory, capable of accommodating about 20 students, in which an examination might, if necessary, be held twice a year.

Five separate papers were set, one on each of the five days. The exercises given were representative of the most important operations in Practical Chemistry, viz., the use of physical instruments, and the determination of physical constants; the preparation of pure compounds, inorganic and organic; qualitative and quantitative analysis, inorganic and organic, and gas analysis.

The following were the papers for each day:-

FIRST DAY, 9 A.M.-4 P.M.

- 1. Standardise the thermometer given to you and calibrate it between 0° and 100°.
 - 2. Prepare a specimen of crystallised arsenic acid.
- 3. Ascertain the constituents of the solution [of morphine hydrochloride] and of the solid substance [potassium iodide containing ten per cent. of sodium chloride] supplied to you.

SECOND DAY, 10 A.M.-5 P.M.

Identify the given organic compound [acetamide] and ascertain:—(1) its solubility in water at 20°, (2) its melting point and boiling point, (3) its relative density at the melting point and at 100°, (4) the percentage of nitrogen it contains.

THIRD DAY, 10 A.M.-4 P.M.

Ascertain what elements, metallic and non-metallic, are present in the given powdered mineral [galena]. Estimate, gravimetrically or volumetrically, the amount of the chief constituents.

FOURTH DAY, 10 A.M.-4 P.M.

From the propyl alcohol given, prepare sufficient propionic aldehyde to enable you to produce about five grams of the ammonia-compound in a pure, well-crystallised state.

FIFTH DAY, 10 A.M.-4 P.M.

- 1. Make an analysis of the gas [commercial oxygen] contained in the iron cylinder.
- 2. Estimate the amount of carbon dioxide in the air of the laboratory.

GENERAL INSTRUCTION.

Enter in your note book a concise record of all the experiments you make, and shortly describe and explain the chemical methods you employ.

Candidates were allowed to consult their private note-books and any works on chemistry they might bring with them to the Laboratory, whilst a copy of Watts' "Dictionary of Chemistry" was available for general reference. The work of each candidate was done under the constant supervision of the Examiners and their assistants. Separate note-books were provided for the record of each day's work, and candidates were required to give up their note-books during the interval in the middle of the day, and again at the close of the day, a new note-book being provided for the next day's work. Candidates were asked not to confer with each other at any period during the Examination, and every precaution was taken to prevent collusion.

The Examiners regret to have to report that in general the work was indifferently done, not only in respect of the results actually obtained, but also in the manner in which it was carried out.

The physical exercises were, as a rule, badly done. Very few of the candidates knew how to verify the graduations on a thermometer at 0° and 100°, and still fewer were familiar with the method of calibration. The serious deficiency in these respects is the more remarkable when it is remembered that every candidate is supposed to have attended a course of instruction in practical physics.

The inorganic preparation and the quantitative analysis were fairly well done by many of the candidates. In the qualitative analysis there was a marked tendency to adhere strictly to a routine of tests, and too much time was therefore spent on these simple exercises.

The organic preparation of propionic aldehyde was badly done in nearly every case. The usual method of proceeding was to fit up precisely the same apparatus as that described in several text-books for the preparation of the more volatile acetic aldehyde, with the result that little or none of the compound passed the condenser. The gas analysis was generally well done.

The records of practical work were usually very poor. Most of the candidates were obviously unaccustomed to write a straightforward, succinct account of their own experiments and observations. Many of them copied the account of the method they had used out of a text-book until they had been warned by the Examiners that the use of a text-book during their work did not entitle them to copy verbatim from it.

The Examiners regret to say that even after every allowance has been made for the several hindrances to which the candidates were subjected, and all possible lenience has been exercised in

awarding marks, they do not feel justified in recommending the admission to the Associateship of more than the following 19 out of the 37 candidates who presented themselves:—

Mr. E. C. C. BALY. Mr. T. KENDREW. " C. Leigh. " F. J. BLOOMER. Miss E. J. LLOYD. ,, A. C. CHAPMAN. Mr. H. H. MANN. J. C. CHORLEY. " F. DENT. " C. H. NEW. " F. E. FRANCIS. " T. H. Norris. ,, A. F. FRYER. , W. ORR. " F. J. HAMBLY. " N. RUDOLF. W. D. SAWERS. E. E. Johnson.

Mr. A. E. WAREING.

The Examiners wish to draw the attention of the Council to the circumstance that many of the laboratory note-books sent in by candidates before the Examination were very defective, and included only a small part of the work which is scheduled in the prescribed course of training in Practical Chemistry. The mere inspection of some of these note-books was almost sufficient to prove the unfitness of certain of the candidates. It would be a more satisfactory plan if these laboratory note-books could be inspected and reported on by the Examiners before the Nominations' and Examinations' Committee decided to admit candidates to the Practical Examination, and it is desirable that candidates should clearly understand that the note-books must contain a concise record in their own words of experiments they have actually performed, and that descriptions of methods and processes should not be copied from text-books.

The Examiners cannot conclude this report without acknowledging their indebtedness to Professor Meldola and the authorities of the Finsbury Technical College, as well as to the Registrar,

Mr. Robertson, for the assistance they received in the difficult task of arranging for, and carrying on the Examination. They also think it right to allude to the efficiency of the arrangements made by Messrs. Baird and Tatlock for the supply of apparatus and materials.

WYNDHAM R. DUNSTAN.
THOMAS FAIRLEY.

September 20th, 1892.

ELECTIONS.

Since the Register went to press (July), 3 Fellows and 12 Associates have been elected by the Council, and 5 Students have been admitted.

Three Associates of the Institute have been admitted to the Fellowship.

ELECTED TO THE FELLOWSHIP.

The following Gentlemen have been admitted to the Fellowship of the Institute without Examination:—

d'Albuquerque, John P., B.A. (Cantab.), Government Laboratory, Barbados, West Indies.

Urick, A. Ph.D. (Heidelberg,) Gula Estate, Perak.

The following Candidate, having passed the Examination in a satisfactory manner, has been admitted to the Fellowship:—
Hambly, F. J., University College, Dundee.

The following Gentlemen, Associates of the Institute, have been admitted to the Fellowship:—

Firby, Alfred, 10, Infirmary Street, Leeds.

Sohn, Charles E., Hop Exchange, S.E.

Williams, W. Lloyd, Phænix Mills, Dartford.

ELECTED TO THE ASSOCIATESHIP.

The following Candidates having passed the Institute Examination in a satisfactory manner, have been elected to the Associateship:—

NAME.	Residence.	College.		
Baly, E. C. C	Bank of England, E.C.	University College, W.C.		
Bloomer, F. J	7, Boundaries Road, Balham, S.W.	University College, Aberyst-with.		
Chorley, J. C	University College, Gower Street, W.C.	University College, W.C.		
Dent, F	28, Consort Terrace, Leeds	Yorkshire College, Leeds.		
Francis, F. E	Kilmorey Park, Hoole, Chester	University College, Liverpool.		
Fryer, A. F	4, Trentham Street, Run- corn	University College, Liverpool.		
Johnson, E. E	Warren Hill House, Loughton, Essex	Finsbury Technical College, E.C.		
Kendrew, T	Queenswood College, near Stockbridge, Hants	Royal College of Science, Dublin.		
Lloyd, E. J. (Miss)	85, Trafalgar Road, Moseley, Birmingham	Mason College, Birmingham and University College, Aberystwith.		
New, C. H	160, Bury New Road, Strangeways, Manches- ter	Mason College, Birmingham		
Norris, T. H	Technical College, Fins- bury, E.C.	Finsbury Technical College, E.C.		
Orr, W	116, Pollok Street, Glasgow, N.B.	Glasgow and West of Scotland Technical College.		

ADMITTED TO THE STUDENTSHIP.

The following Gentlemen have been admitted to the Student-ship of the Institute:—

NAME.	Residence.	Working under.	
Cameron, E. S	51, Pembroke Road, Dublin	Sir C. A. Cameron, F.I.C.	
Dodd, Fred R	Liverpool	Alfred Smetham, F.I.C.	
Kibble, William Oakes	Norton Villa, Buckhurst Hill	Prof. R. Meldola, F.R.S.	
Spencer, E. Stacy	Bentfield Bury, Stan- sted, Essex	Prof. R. Meldola, F.R.S.	
Tulip, P. A	Surgeons Hall, Edinburgh	Stevenson Macadam, Ph.D.	

DEATHS.

- †Bernays, Professor Albert J., Ph.D., F.C.S., St. Thomas's Hospital, S.E.
- Dittmar, Professor William, LL.D. (Edin.), F.R.S., F.R.S.E., Glasgow and West of Scotland Technical College, Glasgow, N.B.
- Draper, H. N., F.C.S., Esterel, Temple Road, Rathmines, Dublin. †Heisch, Charles, F.C.S., City Gas Examiner's Office, 79, Mark Lane, E.C.
- †Hills, Thomas Hyde, F.C.S., 225, Oxford Street, W.
- Makins, George Hogarth, F.C.S., Danesfield, St. Albans.
- Redwood, Professor Theophilus, Ph.D., F.C.S., 2, Fisher Street, Red Lion Square, W.C.
- Sieber, C. H., F.C.S., Croft House, Whitworth, near Rochdale.
- Tate, A. Norman, F.C.S., 7, 9, and 11, Hackins Hey, Liverpool. Thompson, Charles, F.C.S., 15, Patshull Road, N.W.
- Tidy, Professor Charles Meymott, M.B., F.C.S., Barrister-at-Law, London Hospital, E.

OBITUARIES.

ALBERT J. BERNAYS, Ph.D., began his professional career as a lecturer on chemistry and analyst in the town of Derby, and was lecturer at St. Mary's Hospital, Paddington, prior to his appointment to the chair of Chemistry at St. Thomas's Hospital, which he occupied for the long period of thirty-one years. He also held some important analytical appointments, and wrote several works on Chemistry, among them the very complete yet concise "Notes on Analytical Chemistry." Dr. Bernays had, in addition, been Examiner in Chemistry to the Colleges of Physicians and Surgeons. He was an original Member of the Institute of Chemistry, and served on the Council from 1885 to 1889. In

[†] See Proceedings, Part I., 1892.

private life his charming manners, old fashioned courtesy, and great philanthropy, endeared him to all who knew him; and it can be truly said that, in addition to being an excellent chemist and an amiable teacher, he was a good man in every sense of the word.

WILLIAM DITTMAR, LL.D., F.R.S., F.I.C., late Professor of Chemistry in the Glasgow and West of Scotland Technical College, was born at Umstadt, near Darmstadt, Germany, in the year 1833, and his name forms one more item of the list of distinguished chemists, including Liebig, Strecker, Kekulé, and Schorlemmer, who have contributed to make Darmstadt famous.

Though at first minded to follow the pharmaceutical profession, he fortunately determined later on to enter the Laboratory of Bunsen. This was in 1857, and it was not long ere Bunsen discerned the great promise of his student, which ended in his offering William Dittmar the assistantship in his Laboratory.

It was in this capacity that Professor Sir Henry Roscoe first made his acquaintance, and the result of his impression of Dittmar's rare powers, was an invitation to become his private assistant in the Owens' College, Manchester, which Dittmar accepted.

In 1861 he left Manchester to become Dr. Lyon Playfair's chief Laboratory Assistant, but in 1869 returned to Germany, and during the subsequent three years acted as "Privat-Docent" and lecturer on Meteorology at Poppelsdorff. Though offered a chair in Cassel, he decided to return to Scotland in 1872, where he next held the post of chief Laboratory Assistant under Professor A. Crum Brown.

All who really knew Dr. Dittmar, and particularly those who worked with him, learned to respect the excellence of heart, the frank and genial bearing, and the high-souled integrity of the man, as well as his profound knowledge both as a Chemist and a Physicist.

Though Chemists and Technologists in this country may not be aware of it, Dr. Dittmar had a true appreciation of the claims and true bearing of applied Chemistry, and contributed for years important and lengthy articles and reports on the progress of Chemical Industry in this country and America to no less an important organ than the "Chemische Industrie," of Berlin, Edited by Jacobsen. But Dr. Dittmar's fame and reputation may be truly said to have been obtained by his great and infinitely painstaking work in the most refined and exact regions of Inorganic Chemistry and Physics. As the result of work of this kind may be mentioned his communications on the "Challenger" expedition of 1873—1876, his work and publications on the Chemical Balance, and his text-books on Chemical Analysis, including Gas Analysis.

Professor William Dittmar was one of the original members of the Institute of Chemistry, and served as a Member of the Council from 1877 to 1880.

CHARLES HEISCH was born at Blackheath in 1820, and was the youngest son of Frederic Heisch, of Cox, Heisch & Co., America Square, London.

He was a pupil of Richard Phillips, F.R.S., first at his laboratory at St. Thomas' Hospital, and afterwards at the laboratory attached to the Geological Survey in Craig's Court. In 1842 he was appointed Assistant Lecturer on Chemistry at St.

Thomas' Hospital with Dr. Leeson; in 1848 he was elected joint lecturer in Chemistry (with Mr. Thomas Taylor) at the Middlesex Hospital, becoming, on the retirement of Mr. Taylor, sole lecturer on the subject until he resigned the chair in 1875. In 1869 he was elected Superintending Gas Examiner to the Corporation of the City of London, a post which he retained till his death at Brighton on January 2nd, 1892.

Heisch was one of the original Fellows of the Chemical Society, and took an active part in the foundation of the Society of Public Analysts, being appointed joint Secretary with Mr. Wigner, a post which he filled until he was elected President in 1881 and 1882. In 1882 he was elected a member of the Council of the Institute of Chemistry, and served in this capacity until 1884. He contributed several papers to the Chemical Society, the Gas Institute and the Analyst on various matters connected with the analysis of foods, water, gas, &c.

Thomas Hyde Hills, who was an original member of the Institute of Chemistry, though not an original worker in Science, indirectly contributed to its advance by the kindly counsel and material assistance he was ever ready to give to professional men on the threshold of their careers, and by his custom of bringing together socially all who were interested in the progress of science. Many eminent chemists are thus indebted to him for timely aid and advice.

Mr. Hills was born at Maidstone in 1815, and educated at the local Grammar School and at Goadhurst. At the age of 15, he was apprenticed at Brighton to Mr. Thorby, Chemist and Druggist. On leaving Brighton in 1837, he went to London, and entered the well-known house of John Bell, in Oxford Street. In 1848 he was made a partner, and on the death of Jacob Bell in 1859, he became sole proprietor of the business.

It was natural that most of Mr. Hill's public work should be in connection with the Pharmaceutical Society, established shortly after he came to London, mainly through the untiring exertions of his friend, Jacob Bell. He was elected to a seat on the Council of the Pharmaceutical Society in 1860, and remained a member of the Council till his resignation in 1881. He successively filled the offices of Vice-President (1863—1868), Treasurer (1868—1873), and President (1873—1876) of that Society.

In connection with Chemistry, it may be mentioned that Mr. Hills was one of the first, in 1872, to suggest the establishment of, and to offer a yearly contribution to a Chemical Research Fund in association with the Chemical Society, of which he was a Fellow.

Mr. Hills died at his house in Queen Anne Street, after a lingering illness, November 19th, 1891.

George Hogarth Makins, an original Fellow of the Institute, died on April 12th. Mr. Makins was born in 1815, and was educated at a private school at Beaconsfield. Early in life he evinced a taste for scientific study, and at the age of 15 was apprenticed to a surgeon at Uxbridge. He passed through the complete medical curriculum, and became a Member of the College of Surgeons and a Licentiate of the Society of Apothecaries, pursuing his studies at King's College, London, and St. George's Hospital. His inclination for chemical work had been fostered by the teaching of Professor Daniel, and on obtaining his diploma he relinquished any idea of entering on Medical practice. He was shortly afterwards elected to the Chair of Chemistry at the Aldersgate School of Medicine, and then succeeded Professor Fownes as Lecturer on Chemistry at the

Middlesex Hospital. During this period he was occupied with investigations in physical chemistry, but he gradually devoted himself especially to the study of metallurgy, particularly of the precious metals. He devised a process for the precipitation of so-called spongy gold, a preparation at one time largely used in dental practice for fillings. In 1852 he commenced practice as an assayer, and rapidly introduced numerous important changes in the methods in use up to that time. Anthracite coal was substituted for charcoal as a fuel, and the muffle furnace was adapted to the change, the apparatus for "acid parting" was modified, pure gold and silver were adopted as standards in place of the conventional "trial plates" previously employed, and a new and more delicate balance was devised for weighing. He was particularly adept and rapid in the latter operation, and his skill in the preparation of weights led to his being asked to prepare the standards for some of the Colonial mints. This work eminently illustrated the extreme accuracy and patient attention to detail which characterised all his investigations. Ill-health compelled him to abandon the close atmosphere of an assayer's laboratory in 1865, and later the only professional work he retained was the delivery of an annual course of lectures on metallurgy at the Dental Hospital of London. These lectures, considerably amplified by him, were published as a manual of metallurgy, the book passing through two editions. His interest in chemical science was, however, fully maintained. He read much, and acted on the Council of the Institute, as well as upon that of the Chemical Society, of which latter body he became a Fellow as early as 1845. His early association with the Apothecaries' Society of London was also renewed in later life, and he served the offices of Member of the Court of Assistants and Master, his excellent business capacity rendering his services of great value.

Mr. Makins was a man of wide general culture, but of a

modest disposition. He was a good practical mechanist and an excellent musician, and the combination of these two tastes resulted in a hobby for building organs, of which instruments he produced several during his life. As a means of obtaining outdoor employment on relinquishing practice, he also built several houses, acting as his own architect, with considerable success. His kindly nature and thorough rectitude gained for him a large number of friends, who held him in great esteem.

REDWOOD, Ph.D., was born at Boverton, THEOPHILUS Glamorganshire, on March 2nd, 1806, and died in the same house on March 5th, 1892. At the age of 16 he came to London, and was apprenticed to Messrs. John Bell & Co., with whom he spent several years, with the important result of forming a close association with Jacob Bell. In 1841 the Pharmaceutical Society was founded, and in the following year Theophilus Redwood was appointed to the Chair of Pharmacy. Two years later he received the additional post of Director of the Laboratories, and in 1846 he succeeded Fownes as Professor of Chemistry. From 1852 to 1865 he was one of the Secretaries of the Chemical Society, and during the ensuing five years he occupied the position of Treasurer to that body. During the whole period of its existence, dating from 1846, he was the Secretary of the Cavendish Society. In 1854 he was appointed Secretary of the Pharmacopæia Committee, and in 1865 the Medical Council entrusted him with the duty of preparing a new edition of the "British Pharmacopæia," which was published during the following year. The later editions of this work, which appeared in 1874 and 1885, were also produced under his editorship. Among Professor Redwood's earliest contributions to pharmaceutical literature were the work known as Mohr and Redwood's "Practical Pharmacy," and an edition of Gray's "Supplement to the Pharmacopœia." Subsequently, in association with Professor Bentley,

he undertook the re-casting of Pereira's "Materia Medica." For many years he was the Editor of the *Pharmaceutical Journal*, and contributed largely to its pages. In 1856 Professor Redwood was appointed, in conjunction with Professors Graham and Hofmann, to investigate the subject of the supply of spirit free from duty, for the information of the Board of Inland Revenue.

On his resignation of the chair which he had so long occupied, he was appointed Emeritus Professor of Chemistry and Pharmacy to the Pharmaceutical Society, and the Redwood Scholarship was founded in his honour. It is worthy of note, as showing the esteem in which he was held by those who received tuition at his hands, that in 1850 his present and former pupils presented him with a costly service of plate.

The degree of Ph.D. was conferred upon him by the University of Giessen at the request of Liebig when the latter resigned his Professorship.

He was an original Member of the Institute of Chemistry, and served on the Council from 1877 to 1881.

At the time of his death, Dr. Redwood was Public Analyst for the County of Middlesex, for the London districts of Holborn and St. Giles, and for the Borough of Luton.

Professor Redwood was singularly devoid of the self-advertising spirit of the age, and comparatively few were aware of the depth of his knowledge of those subjects which he had pre-eminently made his own. He was, in all that he undertook, essentially thorough and painstaking in a high degree, and his long career was one of well-nigh incessant labour, for he allowed himself but scant periods of relaxation. To the soundness of his pharmaceutical and chemical views and to his literary

ability, his numerous contributions to the *Pharmaceutical Journal* and other publications bear ample testimony, while the affectionate regard of his former pupils affords sufficient evidence of his success as a teacher. In debate he was an effective as well as a lucid speaker, and the attention with which his public utterances were invariably received was doubtless due to the fact that he never spoke on a subject which he had not fully mastered. To his even and philosophic temperament, Professor Redwood probably owed much of the unusual vigour which characterised his declining years, for he had had his full share of the cares and troubles of this life; doubtless, however, he was encouraged and sustained by the reflection that his labour had not been in vain, and that he would leave behind him an imperishible record of his successful efforts in the cause of Pharmaceutical education and progress.

ALEXANDER NORMAN TATE, eldest son of the late Mr. Alderman James Tate, of Wells, Somerset, was born in that City on February 24th, 1837. He was educated under the Rev. Wm. Aldrit, M.A., at the Cathedral Chapter Grammar School, having a strong inclination to natural sciences and especial love for Chemistry. He spent eight years of his life, after leaving school, in the study of pharmacy, which in those [days was almost the only means of proceeding to more strictly chemical studies. During these years Mr. Tate left Somersetshire, settled in Liverpool, and eventually relinquished pharmacy for analytical and research work, under the late Dr. Sheridan Muspratt. On leaving Dr. Muspratt he was for several years engaged as a Chemist and Manager in the Works of Messrs. J. Hutchinson & Co., Widnes, and other chemical manufacturing firms in Lancashire, the Isle of Man, North Wales, giving special attention to alkali and chlorine manufactures and oil refining. He become an authority on petroleum in the early days of its importation, reading several papers on

the subject before scientific societies and publishing a book entitled, "Petroleum and its Products," which was widely circulated and translated into French and German.

From 1867 to the time of his death, on July 22nd of this year, he was very actively engaged in Liverpool in his practice of Analytical and Consulting Chemist, in which he justly obtained a widespread reputation, not only in England, but on the Continent and in America.

In the town of his adoption, however, he was not only the analyst of repute, but the populariser of science, the ardent worker as Honorary Principal, and for many years Senior Teacher, of the Liverpool Science and Art Classes, which, commencing in 1870 with a mere handful of students, developed under the fostering care of Mr. Tate and his colleagues into one of the largest and most successful science and art schools in the country, and in connection with which, a subscription list has been opened and largely subscribed to for the purpose of endowing a Scholarship as a memorial to the late Mr. Tate. In 1880, at a meeting held in the Town Hall, Liverpool, Mr. Tate was presented with an address and handsome silver testimonial in recognition of his services to science.

Mr. Tate was a Fellow of the Chemical Society, Fellow of the Institute of Chemistry (twice on its Council), Fellow of the Geological and Royal Microscopical Societies. A Vice-President of the Society of Chemical Industry, and Member of the Society of Public Analysts.

In Liverpool, Mr. Tate was an earnest and ceaseless worker in connection with the local scientific societies.

As a man, Norman Tate was true and loyal in every relationship in life, and only those who were constantly by his side can form any estimate of his untiring energy, the reality of his work, the honesty of his purpose, his heroism in suffering, and above all, the infinite loving kindness and tenderness of his heart.

CHARLES MEYNOTT TIDY, M.B., Barrister-at-Law. By hisdeath the Institute lost one of its most prominent members, and one who had been associated with it from the first, and had served the Council both as an ordinary member, and as Vice-President. He was Professor of Chemistry, Medical Jurisprudence, and Public Health at the London Hospital, the official Analyst to the Home Office, and Medical Officer of Health for Islington. He wrote many works on legal medicine, and was the author, conjointly with Dr. Woodman, of a "Handy Book of Forensic Medicine and Toxicology." He had for some time assisted in drawing up the monthly and annual reports on the quality of the water supplied to London. He graduated with the highest honours in Aberdeen University, was a member of the Royal College of Surgeons, and a licentiate of the Society of Apothe-His position was due to no accident of birth or education, but was the result of inherent ability and indefatigable work.



SUPPLEMENT TO THE REGISTER.

FELLOWS.

d'Albuquerque, John P., B.A. (Cantab.), Government Laboratory, Barbados, West Indies.

Firby, Alfred, 10, Infirmary Street, Leeds.

Hambly, Fred. J., University College, Dundee.

Sohn, C. E., 25, Beverley Boad, Amerley, S.E., and Hop Exchange, S.E.

Urick, A., Ph.D. (Heidelberg), c/o Messrs. Garth & Co., 30, Trinity Square, Tower Hill, E C.

Williams, W. Lloyd, Phoenix Mills, Dartford.

ASSOCIATES.

Baly, E. C. C., Bank of England, E.C.

Bloomer, F. J., 7, Boundaries Road, Balham, S.W.

Chorley, J. C., University College, Gower Street, W.C.

Dent, F., 28, Consort Terrace, Leeds.

Francis, F. E., Kilmorey Park, Hoole, Chester.

Fryer, A. F., 4, Trentham Street, Buncorn.

Johnson, E. E., Warren Hill House, Loughton, Essex.

Kendrew, T., Queenswood College, near Stockbridge, Hants.

Lloyd, E. J., Miss, 95, Trafalgar Road, Moseley, Birmingham,

New, C. H., 160, Bury New Road, Strangeways, Manchester.

Norris, T. H., Technical College, Finsbury, E.C.

Orr, Wilham, 166, Pollok Street, Glasgow, N.B.

STUDENTS.

Dodd, Fred. R., 66, Mount Pleasant, Liverpool.

Kibble, William Oakes, Norton Villa, Buckhurst Hill.

Spencer, E. Stacy, Bentfield Bury, Stansted, Essex.

Tulip, P. A., Surgeons Hall, Edinburgh.

CHANGES OF ADDRESS.

Berridge, H. D., Fotheringhay, Oundle, Northampton.

Bicket, John Hughes, The Limes, Cranwich Road, Stamford Hill, N.

Busfield, James, Scoreby House, Elms Road, Clapham Park, S.W.

Clayton, G. C., bei Hernn Professor Krafft, Margasse 2, Heidelberg.

Coomber, Thomas, Roxhurst, Clarendon Boad, Redland, Bristol.

Dent, W. Y., 5, Caithness Road, Brook Green, W.

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Leather, Walter J., Ph.D. (Freiburg), c/o Secretary, Land Revenue and Agricultural Department, Government of India, Calcutta.

Lishman, G. P. (Student), Herrington Hall, Fences Houses, Durham.

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McGowan, G., The Harris Institute, Preston.

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Bredin, J. C., late of 18, Faberstrasse, Leipzig, Germany.

Harbord, F. W., late of Messrs. Hatton, Sons & Co., Bilston.

Jordan, Frank, late of Havelock House, Halstow Road, Westcombe Park, S.E.

Peterson, F. W., late of H.M. Mint, Bombay.

Towill, E. J., late of 57, Rheinstrasse, Wiesbaden, Germany.

Youle, W. E. (Student), late of 30, Furnival Street, Holborn, W.C.

RESIGNATIONS.

Beringer, Cornelius, F.C.S., 9, West End, Redruth, Cornwall.

Vieth, Paul, Ph.D., F.C.S., 31, St. Petersburg Place, Bayswater, S.W.



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INSTITUTE OF CHEMISTRY

OF

GREAT BRITAIN AND IRELAND.

REGISTER.

1892.





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THE

INSTITUTE OF CHEMISTRY

OF

GREAT BRITAIN & IRELAND.

FOUNDED OCTOBER, 1877.

INCORPORATED BY ROYAL CHARTER, JUNE, 1885.

REGISTER OF FELLOWS AND ASSOCIATES FOR 1892.

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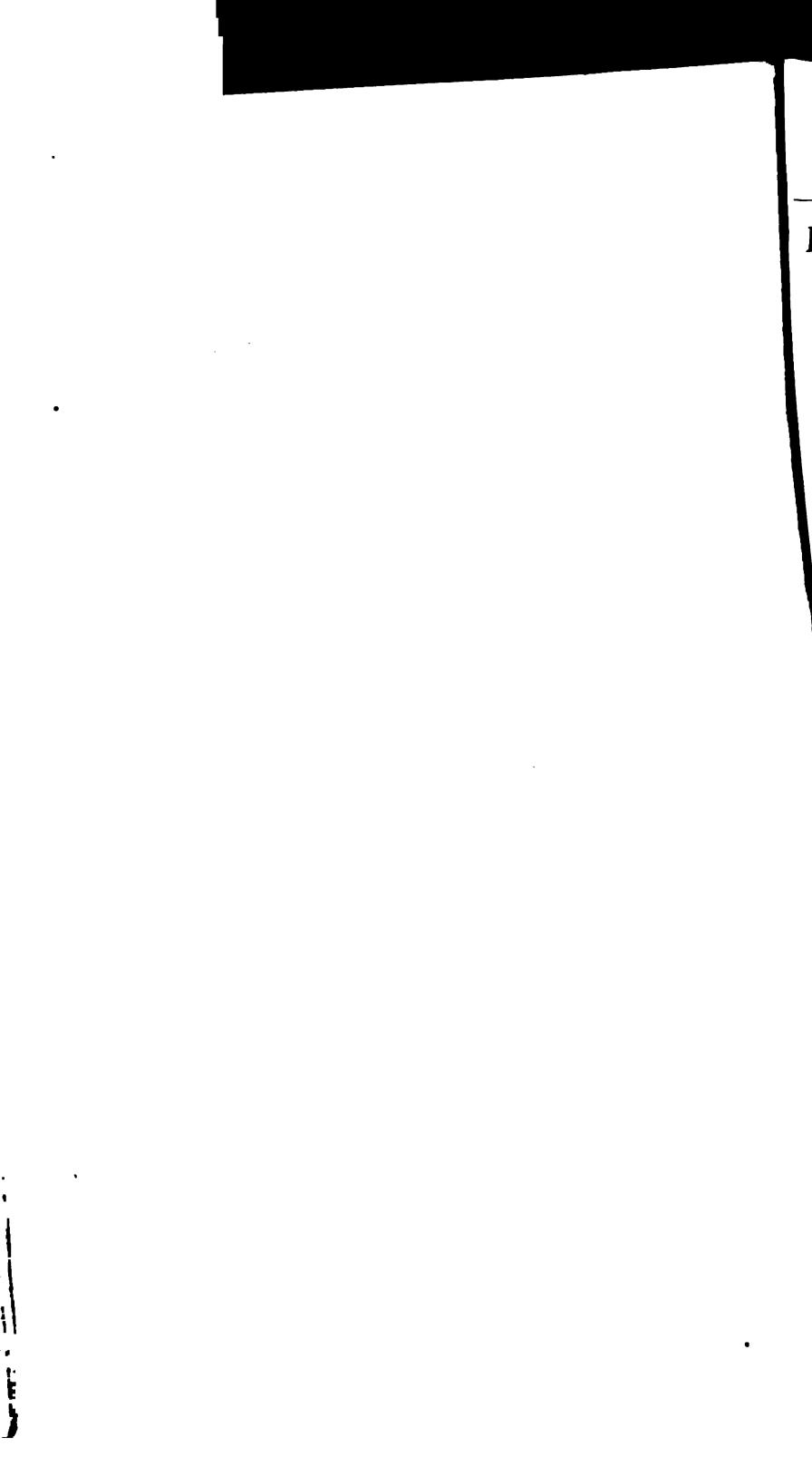
G. H. ROBERTSON,

Registrar and Secretary.

tst July, 1892.



Fellows and Associates are requested to send
immediate notification of change of address to
the Secretary.
the Secretary.
the Secretary.
the Secretary.



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1. Bye-law 72:—

"If any Fellow or Associate shall allow his annual subscription to be in arrear for one year, he shall be liable to be excluded from the Membership, or to be suspended in the manner provided by Clause 16 of the Charter."

2. Resolution of Council, passed Friday, 13th March, 1891:-

"That in all future lists of Members of the Institute of Chemistry, no degree be inserted without the name of the University granting the degree being annexed; further, that no degree or other qualification be inserted unless it be shown to be genuine to the satisfaction of the Council."

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Fellows who have paid Life Compositions are marked *

Abel, Sir Frederick A., K.C.B., Hon. D.C.L. (Oxon.), Hon. D.Sc. (Cantab), F.R.S., V.P.C.S., Imperial Institute, Imperial Institute Road, London, S.W., and 40, Cadogan Place, S.W.

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Adeney, Walter Ernest, F.C.S., Royal University, Dublin.

Adrian, Huskisson, Rev., B.D. (Oxon), East Wing, The School, Reading.

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Broadbent, Harry, 50, Belle Vue Road, Leeds.

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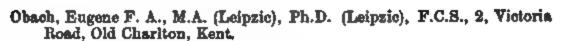
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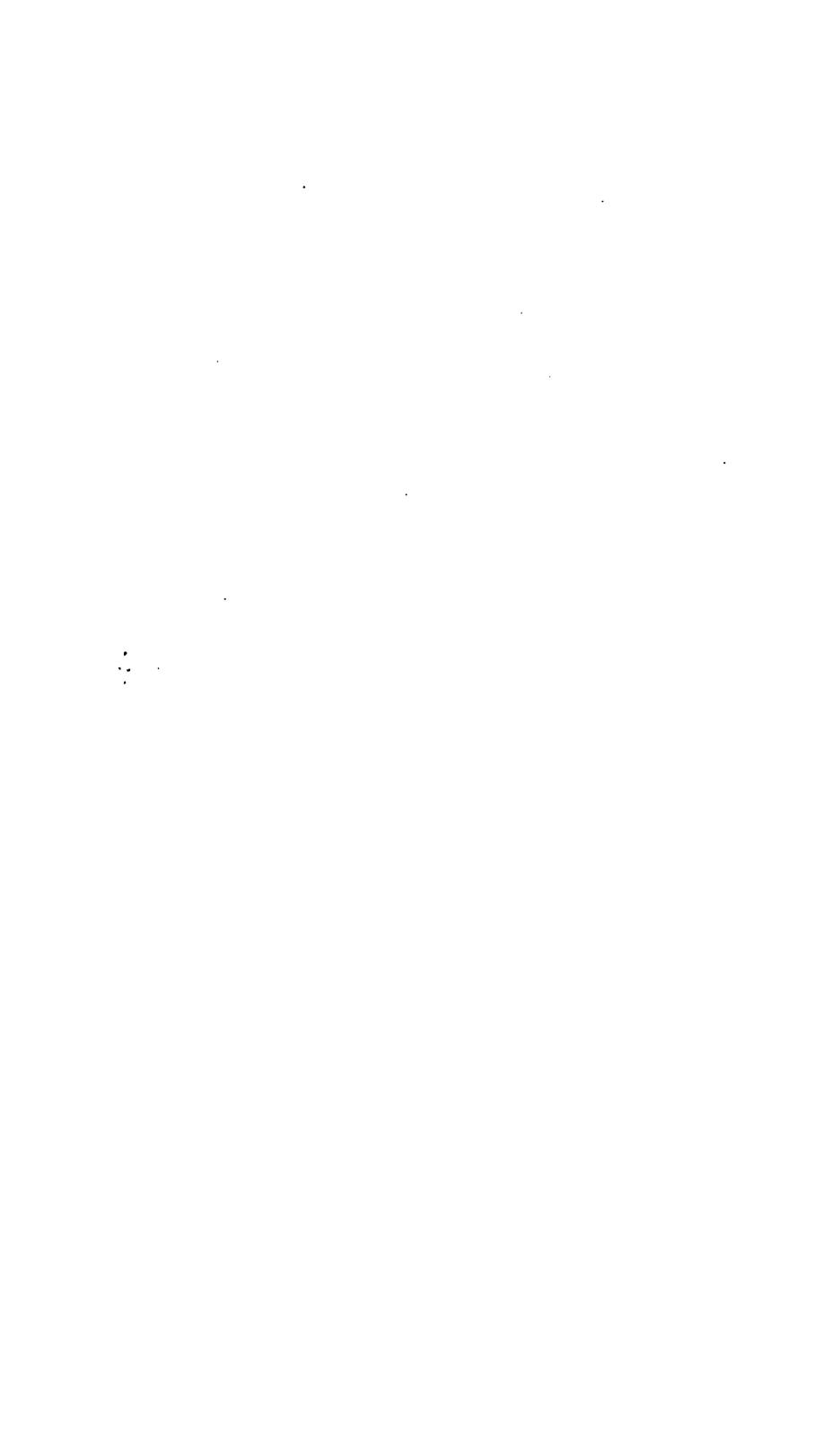
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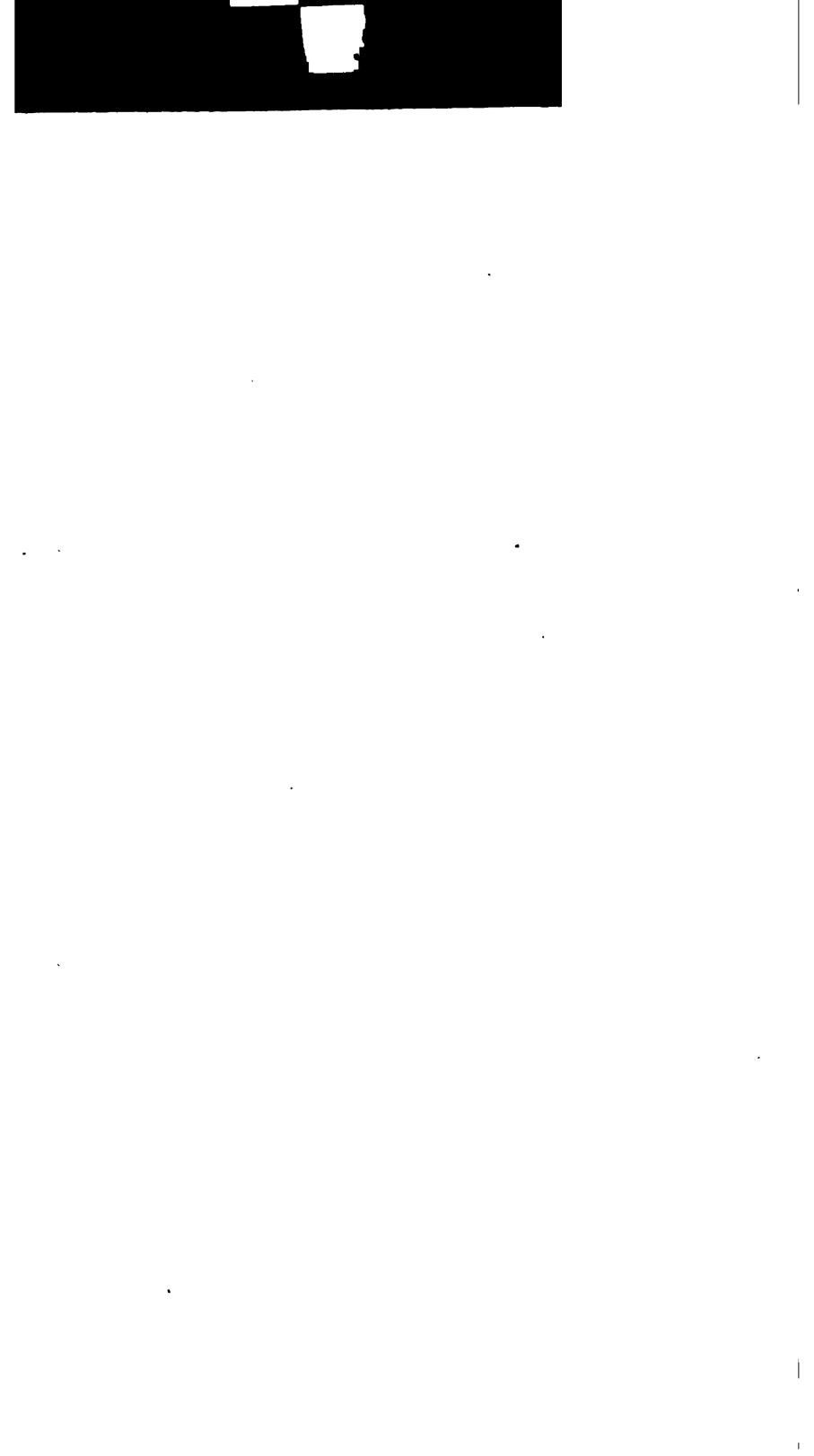
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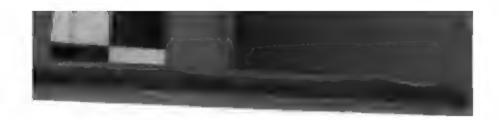


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